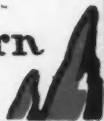


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A Magazine of Western
Ornithology



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September-October, 1936

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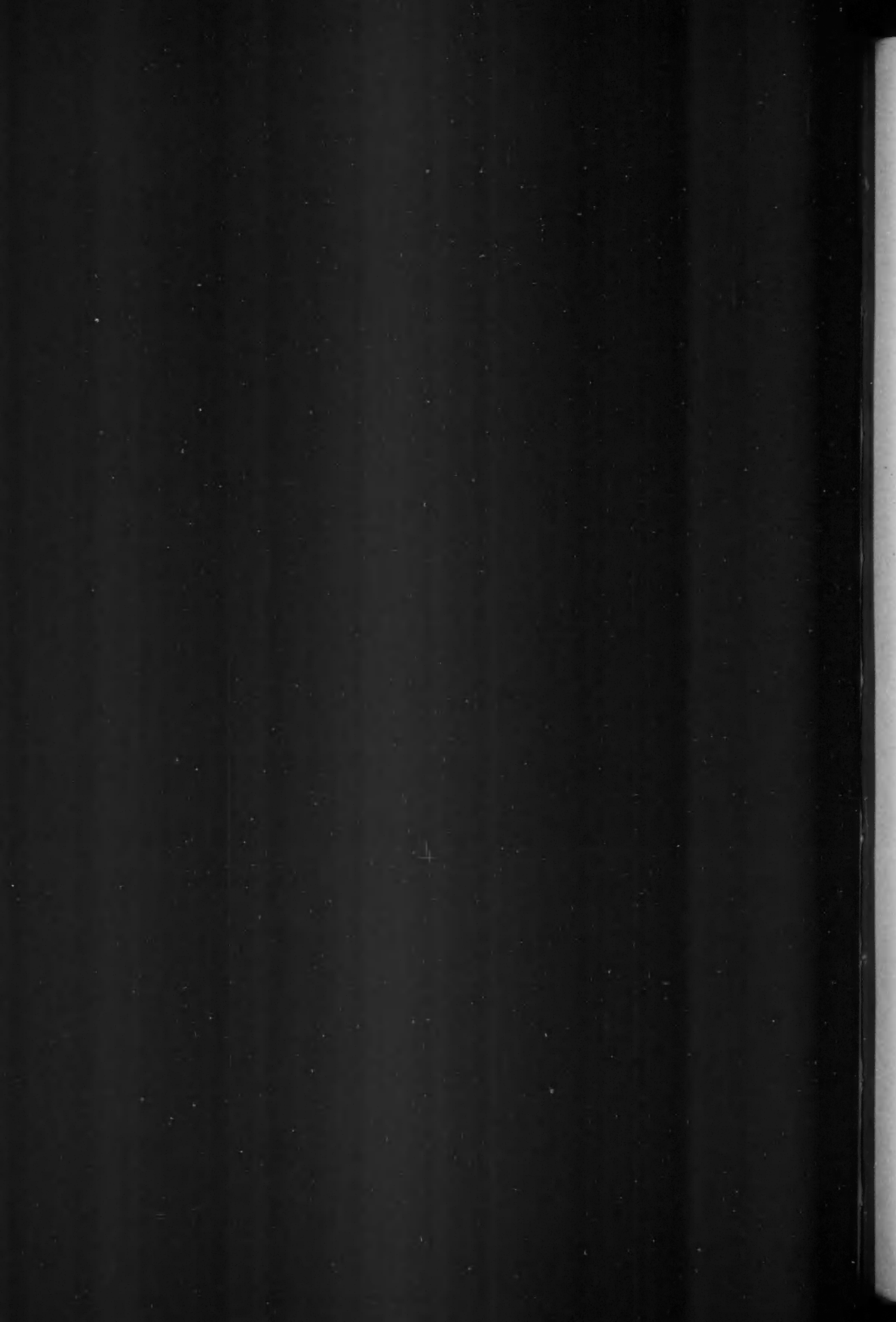
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THE BIRD LIFE OF LAKE BOWDOIN, MONTANA

WITH FIVE ILLUSTRATIONS

By WINTON WEYDEMEYER and V. L. MARSH

Riding in summer across the endless prairies and benchlands of northeastern Montana on U. S. Highway No. 2, the nature-loving motorist receives the impression that here is a desolate land indeed. Mile beyond mile the sun-scorched lands roll to a hazy horizon. Local areas of sagebrush and greasewood and vast reaches of thin, light soil covered with prickly pear and dwarf grasses testify to the dryness of the climate. Occasionally longspurs and horned larks rise from the roadway and drift away to one side; at long intervals a solitary hawk may be seen in quest of ground squirrels or grasshoppers. But except in the river bottoms and in the restricted areas of irrigated farms, few other evidences of bird life are seen. One's mind scarcely entertains the possibility of observing waterfowl.

In Phillips County, about seven miles northeast of the town of Malta, the rolling prairie drops to a wide depression with its surface leveled by water. Let the motorist stop here to look and listen, to scan the surface of the water which reaches nearly to the highway. Along the shore he may see long-legged birds in active motion; scattered across the shimmering expanse beyond will be groups of dark, moving forms. Then he will hear, from far out across the water, a strange medley of bird notes—some raucous, some mellifluous; some plaintive, others defiant. And looking more closely, he will discern two dark lines of land relieved with rows and dots of vivid white; and perhaps in the air above, a dim cloud of shifting, intermingling forms.

Here lies Lake Bowdoin, Montana's most important collective breeding-ground for waterfowl. Famed throughout eastern and central Montana since pioneer days as a hunting-ground, for a third of a century the lake and the lands surrounding it have been owned by the federal government, as a part of the St. Mary's-Milk River Irrigation Project. During that time the area has been a subject of much contention among sportsmen, conservationists, and politicians. Although in 1921, in vetoing an act of congress giving a local gun club patent to a portion of the lake and shore, President Wilson recommended that the area be made a federal bird reservation, no action was taken by the proper authorities. In recent years the contention became intensified; suffice it to say here that the expressed urge of a great number of interested Montana citizens stimulated the Biological Survey in 1935 to set aside the greater portion of the lake and an adjoining marsh as a federal refuge. In the fall of that year the area established was fenced, and for the first time migratory waterfowl were enabled to enjoy this hereditary feeding ground unharassed by gunfire. Under adequate protection and with proper control of the water level and food supply, Lake Bowdoin under

federal supervision should be even more important as a breeding and feeding area for water birds than it has been in the past.

In spite of its renown among hunters, Lake Bowdoin is evidently little known to ornithologists. The only published account of its bird life we have knowledge of is a short article by George Willett (Condor, vol. 9, 1907, pp. 105-106) describing his visits to the area on three days during the nesting season of 1903. It is our purpose in this paper to describe the area and discuss briefly its adaptations and needs as a refuge, and to record the results of our observations of its bird life during four seasons. The dates of our visits to the area are these: by Marsh, June 19-21, 1932, June 18-22, 1933, June 17, 1934; by Marsh and Weydemeyer, June 7-13, 1935.

ECOLOGICAL CONDITIONS

Description of the area.—Lake Bowdoin is situated in central Phillips County, Montana, and lies between the Great Northern Railway and U. S. Highway No. 2, seven to fourteen miles east of Malta. Naturally a typical prairie lake fed by surface drainage, the water is very strongly alkaline, and its level varies considerably at different seasons and in different years. At the usual water level the lake proper covers about 3500 acres to an average depth of about four feet. The northeast and northwest shores of the lake, and the central portion of the south shore, are marked by rising land and remain fairly constant; but from the southwest and southeast arms of the lake the land stretches levelly over several thousand acres south and east of the lake, and much of this area is at times in spring covered by water. One portion of this area, comprising about 1200 acres northeast of the town of Bowdoin (named "overflow marsh" on the map) lies at a lower level than the main overflow area, and until about 1905 this was permanently covered with about two feet of water, affording an excellent nesting-ground for ducks and other birds. About that time, however, the U. S. Reclamation Service constructed ditches that cut off much of the flood water supply of the entire area, and a private ditch tapped this marsh and lowered its level. Since that time this marsh has been dry most of the time after early spring. This marsh should be restored to its former level by damming the old ditch, which no longer serves its original purpose. (See fig. 32.)

A supply canal of the Milk River irrigation project roughly parallels the northwest shore of the lake, and a sluiceway leading to the lake basin near the old clubhouse site at the westernmost point of the lake makes it possible to empty water into the lake from this source. In the past this possibility has not always served a useful purpose, for at least in one season water was dumped into the lake during the nesting season, and probably thousands of nests of ducks, geese, gulls, terns, and shorebirds were destroyed by the rising water level. Under federal control such a mistake can be avoided; the lake level should be kept as high as possible by supplying water from the ditch in late summer or autumn.

The nesting grounds.—The rising land bordering the northeastern, northwestern, and central southern permanent shores affords little cover for nesting. Only in restricted areas is this used by shorebirds and a few ducks. But the shallow water and flat shores of the two arms of the lake support heavy growths of bulrushes, cat-tails, and marsh grasses, and furnish cover for nesting ducks, geese, grebes, and coots, as well as for shorebirds and for hundreds of red-wings and yellow-heads. A few small islands in the central part of the lake are used by nesting colonies of pelicans, blue herons, cormorants, gulls, and terns, and by ducks, geese, and shorebirds.

Food and cover plants.—The aquatic food plants of the lake are limited by the extreme alkalinity of the water. A good growth of widgeon grass (*Ruppia* sp.) occurs

practically everywhere over the lake, constituting the most important food plant. Sago pondweed (*Potamogeton pectinatus*) grows in some of the shallower water of the two arms of the lake. In 1932, Marsh found a water buttercup (*Ranunculus* sp.) growing over several acres near the north corner of the lake, but we did not find the

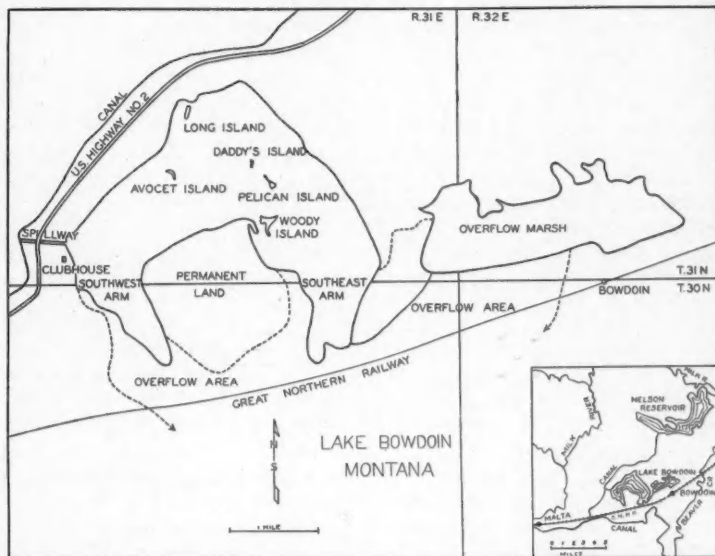


Fig. 32. Lake Bowdoin, central Phillips County, Montana, showing local features referred to in accompanying text.

patch in 1935 and could secure no specimens for identification. Experimental plantings of many well-known food plants have all resulted in failure, due to the extreme alkalinity of the water. The bulrushes (*Scirpus occidentalis*, *S. campestris*, and *S. americanus*) and cat-tail (*Typha latifolia*) which grow in and along the two arms of the lake, in the overflow marsh, and in restricted patches along the shores of the mainland and of Woody Island, are important for nesting cover and useful also as food plants.

Several kinds of grass-like sedges (*Juncus* and *Carex* sp.) grow prolifically along all shores except on the northeast side of the lake, furnishing excellent cover. A small heliotrope (*Heliotropium spathulatum*), which grows abundantly on the moister portions of the islands and shores, offers cover for nests of gulls, terns, and ducks. Nearly every Common Tern nest found in 1935 was situated beside a clump of this plant. Grasses important for cover along the shores and on Long Island include foxtail (*Hordeum jubatum*), *Agropyron Smithii* and *A. spicatum*, and *Poa nevadensis*. On Long Island, where in 1933 hundreds of ducks nested, cover is provided also by rose (*Rosa Fendleri*), cocklebur (*Glycyrrhiza lepidota*), morning glory (*Ipomoea purpurea*), lamb's quarter (*Chenopodium album*), and june grass (*Koeleria cristata*). The higher portion of Woody Island, which supports most of the pelican, heron, and cormorant population of the lake, is covered with an open growth of greasewood

(*Sarcobatus vermiculatus*) which furnishes support for heron nests, nesting material for geese, gulls, pelicans, herons, and cormorants, and shade and cover for young pelicans, gulls, terns, and shorebirds. Bulrushes and sedges grow along parts of the shoreline of this island, and most of the cover grasses and plants already named occur there also. A short grass (*Distichlis dentata*) grows in dense mats between the patches of greasewood, making a good turf for the young pelicans to rest on. A plant on this island that is injurious to birds, especially to young pelicans, is the prickly pear (*Opuntia polyacantha*), a heavily-spined cactus that occurs over the higher portion of the island where the pelicans, herons, and cormorants nest. This cactus also grows abundantly along the higher shores of the lake, especially on the east and south shores. (See fig. 33.)

Other food resources.—The supply of fish, which constitutes the principal food of the pelicans, herons, and cormorants, and, presumably, varying proportions of the food of the gulls, terns and grebes, is obtained mainly from the carp (*Cyprinus* sp.) occurring in Lake Bowdoin, in Nelson Reservoir (a larger and artificial lake lying about six miles to the northeast), and in irrigation canals and ditches. Normally, Lake Bowdoin is well stocked with carp, but in 1935 we saw no sign of a live fish; instead, thousands of tons of carp carcasses, up to 28 inches in length, lined the shores of the islands and mainland. A period of severe cold during the preceding winter, when the lake was at a low level, had developed so thick a covering of ice that the carp had evidently been smothered. It seems likely that the lake will become restocked naturally if water is emptied into it from the canal. The maintenance of a maximum supply of water in the lake would probably prevent a recurrence of this destruction of carp even in severe winters.

The gulls and terns range freely over the irrigated farmlands around the lake, utilizing the natural food resources available there.

Enemies and diseases.—The birds of Lake Bowdoin are fortunate in being little disturbed by predators. The island nesters are safe from prowling animals; occasional damage to shore nesters may be done by wandering coyotes, weasels, and skunks, but we have observed no evidence of any destruction by these species. Crows have not been seen near the lake; only a few occur in the surrounding region. Hawks are scarce. In 1935 a Marsh Hawk and a Prairie Falcon were seen to pass over the southwest arm of the lake nearly every day, always pursued by a noisy throng of red-wings and yellow-heads; and two Swainson Hawks were seen near the west shore. No hawks were seen near any of the islands. Probably the greatest destruction of young birds in the past has been done by a large pack of half-wild, half-starved dogs owned by a rancher living near the east shore of the lake. Horses and cattle grazing along the shores have destroyed nesting cover and probably nests. This stock hereafter will be kept out by the fence, and the dog problem should be properly met by the Biological Survey.

In the past the birds have been little molested by human enemies. Very few local residents have ever visited the islands or roamed the shores except during the hunting season. The unusual lack of raids upon the nesting colonies of pelicans and herons by sportsmen is due to the fact that practically no game fish, and hence no fishing, occur in that region.

The alkalinity of Lake Bowdoin is great; during summer and fall deposited alkali salts surface the mudflats along the shores and rise in great white clouds when a strong wind blows. Hence the occurrence of "duck sickness" is to be expected at times. Reporting in 1918 on investigations of "duck sickness" made by the United States Biological Survey, Wetmore wrote: "An outbreak that occurred at Lake Bowdoin,

near Malta, Mont., in August and September, 1915, killed large numbers of shorebirds and many ducks. A few birds were still affected after the 1st of October. Individuals examined at this time had the same malady as the ducks in Utah, but it can not be stated definitely that all had died from this trouble." (U. S. D. A. Bulletin No.



Fig. 33. Typical view on Woody Island, showing characteristic plants, two Double-crested Cormorants on their nests, a Great Blue Heron shading its young from the sun, and White Pelicans at their nests. Photographed June 10, 1935.

672, *The Duck Sickness in Utah.*) We have no knowledge of subsequent reports of the occurrence of this sickness at Lake Bowdoin.

We were particularly interested in the relation to other nesting birds, of the gulls and terns, traditional egg destroyers. At Lake Bowdoin the Common Terns and Ring-billed, California, and Herring gulls nest on the same small islands inhabited by pelicans, herons, cormorants, geese, ducks, and shorebirds, many of the gulls' nests being situated only a few feet from the nests of some of these other birds. Often during our visits the greater fear or caution of these various species caused their nests to be exposed to the bolder gulls and terns, sometimes for several hours at a time, while we remained in a blind. Yet not once during our visits in four seasons was a gull or tern seen to molest the eggs or young of any other bird.

THE BIRD POPULATION

The islands.—Woody Island, largest and most important of the islands, is roughly triangular in shape and about five acres in extent. The central portion, embracing about two-thirds of the area, lies at an elevation of two to five feet above high-water level, and is covered with a scattered growth of greasewood averaging about three feet in height. The three "points" of the island lie lower, are mostly sandy and exposed, and are bordered in places by a growth of bulrushes. The bird population of this island has remained fairly constant during the four seasons of our visits, but it differs considerably from that observed by Willett in 1903. At that time he found hundreds of ducks (Blue-winged and Green-winged Teal, Mallard, Canvasback, Baldpate, and Shoveller) nesting there; Avocet and Common Tern nests were abundant, and two Spotted Sandpiper nests were found. He found no White Pelicans, Great Blue Herons, or Ring-

billed Gulls, which now make up the bulk of the bird population of Woody Island, although he found birds of these three species on Pelican Island. In 1935 our census of Woody Island disclosed about 200 nesting pairs of White Pelicans, 50 or 60 Great Blue Heron nests, 7 Double-crested Cormorant nests, at least 1000 Ring-billed Gulls (650 adult birds were counted at one time in midday), about 50 California Gulls and 10 Herring Gulls, 25 Common Tern nests, 3 Canada Goose nests, 1 Redhead nest, at least 5 pairs of Spotted Sandpipers, about 150 Red-wings, and at least 5 pairs of Nevada Savannah Sparrows. The Common Tern population was far greater in the three preceding years (numbering into the thousands in 1933), and at least twice as many gulls were present in 1933. Many ducks, especially Mallards, Pintails, and Baldpates, nested on this island in 1933, and 12 or 15 nests were found the following year. In 1922, Harry Cosner, local deputy game warden, counted 78 Canada Goose nests on Woody Island.

The population of Pelican Island is even more variable. This island covers only about an acre at high water, rising four or five feet in the central portion; it is gravelly, with very little cover. In 1903, Willett found a few ducks, a colony of Ring-billed Gulls, a small colony of White Pelicans, and hundreds of Great Blue Herons. During the four years 1932-1935, very few gulls and ducks nested there. One Double-crested Cormorant nest was situated there in 1932 and in 1934. About 20 nests of the Great Blue Heron were on this island in 1932, and about 10 nests in each of the following years. About 40 White Pelican nests were found in 1932 and 1934, only 6 in 1933, and 116 sets of eggs were counted in 1935.

Long Island, lying only a few rods offshore near the north corner of the lake, covers about three acres and is practically all dry prairie in character. The east shore rises abruptly to an average height of about six feet; from here the land slopes gently to the west shore, which is margined in some places by narrow mudflats and growths of bulrush. The land generally bears a tall growth of grasses and other herbs, with patches of rosebush, affording excellent cover for ducks and geese. A few pairs of Spotted Sandpipers nest there yearly, and several pairs of Wilson Phalaropes nested there in 1933. In that year, when the duck population of the lake numbered perhaps 40,000 birds, this island was literally covered with duck nests, mainly those of Baldpate, Gadwall, Pintail, Blue-winged Teal, and Mallard. In 1935, however, when fewer than 1200 ducks were seen on the lake, no duck nests were found on Long Island, and only two on the other islands. With the exception of a few Redheads, all the ducks evidently were nesting along the shores of the mainland. One Canada Goose nest was found on Long Island; a few Spotted Sandpipers and Red-wings were the only other birds occurring there regularly. Long Island was not visited in 1934; in 1932, due to the low level of the lake, it was connected with the mainland and was little used by birds.

Half a mile northwest of Pelican Island, lowering of the water level in spring exposes a small gravel-bar known as Daddy's Island. In June of 1935 two ends of this island were exposed, each covering about a quarter of an acre. The north bar, bare of vegetation, contained 2 Avocet nests. On the south bar, which bore a sparse growth of heliotrope plants, we found 3 Avocet nests, 1 California Gull nest, and 13 Common Tern nests.

Another small island, similar in character, lies about a quarter of a mile off the central northwest shore. We named this Avocet Island. In 1935 this island consisted of a crescent-shaped gravelly, rocky bar covering about an acre, its only vegetation a few clumps of grass and patches of heliotrope in the highest central part. This central area contained 15 Common Tern nests and 7 Avocet nests. A pair of California Gulls

and their small young were here, and about 25 Black Terns occurred on the island, but were not nesting.

Population trends.—Most kinds of water birds at the lake have not varied greatly in numbers during the four seasons of our visits, except in 1933, which year was characterized by an unusual abundance of practically all species. Lack of accurate reports for preceding years makes it impossible in most cases to determine the present trend of fluctuations in population. It is encouraging to note that the White Pelican population is now much greater than it was at the time of Willett's visits in 1903. It is possible that the mortality of nestlings in 1935 may have been greater than normal, due to the unusual absence of carp in the lake and the greater difficulty of securing these fish in the deeper waters of the distant Nelson Reservoir. It seems likely that under the control of the Biological Survey the colony of White Pelicans can be preserved at about its present strength.

The Great Blue Herons of the lake have not varied greatly in numbers during the four seasons of our visits except in 1933, when between 500 and 1000 birds were present; but their nests cannot usually be counted by the "hundreds" as reported in 1903 by Willett. The few pairs of Double-crested Cormorants now nesting on Woody and Pelican islands have evidently become established there since 1903; reports of their presence date back to "a number of years" prior to 1927. Gulls have evidently increased since 1903. Willett reported only a small colony of one species, the Ring-billed Gull. During the years 1932-1935 the gull population has remained fairly constant, the largest estimate being 2000 to 5000 adults in 1933. The Common Tern population was unusually small in 1935; about 150 birds were present at the lake, as compared with the "peak" population of perhaps 8000 birds in 1932.

The duck population of the lake has suffered the constant decrease that has prevailed in general over the continent. The cover and food plants available in that area are sufficient to support a regular nesting population of at least twenty times the number of ducks present in 1935. In fact, ducks that year numbered only about three per cent of the actual 1933 population. The number of Canada Geese summering at the lake has varied considerably. Willett in 1903 found no nesting birds, though he found two old eggs of the previous season. In 1922, as has been mentioned, 78 nests were counted on Woody Island. In each of the four years of our visits a few pairs of these birds have been present.

SUMMER BIRDS OF THE LAKE AND VICINITY

The following annotated list of species includes both the water birds and the land birds which we have observed at Lake Bowdoin, or within seven miles of its shores, during our June visits in the four years 1932 to 1935, inclusive.

Colymbus nigricollis californicus. Eared Grebe. Common along the west side of the lake during all four years. Approximately 400 were counted there June 8, 1935. At that time we were unable to locate any nests in the marginal bulrushes which we could penetrate with our canoe, and no young birds were seen on the water.

Aechmophorus occidentalis. Western Grebe. Occurs in varying numbers along the north and west sides of the lake. Several hundred were present in 1933; in 1935 we estimated the total number present to be 10 or 12.

Podilymbus podiceps podiceps. Pied-billed Grebe. One record: a single bird was seen in June, 1933.

Pelecanus erythrorhynchos. White Pelican. Nests regularly on Woody and Pelican islands. Evidently more common now than in 1903, when Willett found none on Woody Island and only a small colony on Pelican Island. We estimated the adult population in 1935 to be about 800 birds, and a somewhat larger number was present in 1933. The Pelican Island birds usually nest later than those of Woody Island. On June 8, 1935, the Pelican Island nests held 116 sets of eggs and no young, whereas on Woody Island we found about 70 sets of eggs and about 150 broods of young,

the largest about one-fourth grown. Yet the birds of the two islands evidently comprise a single colony, as the number of pairs nesting on Pelican Island has varied greatly: about 50 nests in 1932, 6 in 1933, 40 in 1934, and 116 in 1935.

The season of nesting has varied greatly during the four years of our visits. In 1932 all of the eggs had hatched by June 19, and most of the young were more than half grown. In 1933 by that date about half of the young birds were large enough to band. The following season only about half of the eggs had hatched by June 17, and about 120 nestlings were large enough to band. A season of nesting similar to the last was indicated in 1935. The nests are composed generally of a heavy lining of sticks and twigs laid over a crater-shaped mound of dirt two to three feet across and four to eight inches high, though in some cases the lining is scanty or missing.

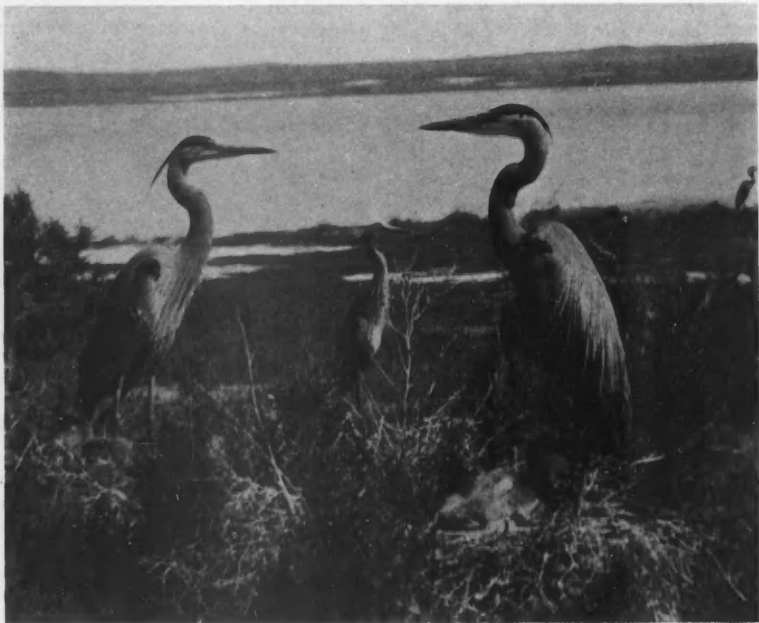


Fig. 34. Great Blue Herons at their nests on the ground of Woody Island. Photographed June 10, 1935.

During the afternoon of June 9, 1935, we erected a covered burlap blind five feet square and six feet high in the center of Woody Island, among the pelican, heron, and cormorant nests. The next morning we entered the blind at eight o'clock and remained there for five and one-half hours, observing and photographing the birds of these three species. Within an hour after we entered the blind the pelicans had returned to their nests, and thereafter they paid little attention to slight sounds within the blind or to movements of the burlap. Several times, however, dozens of the pelicans in our vicinity suddenly took wing with no apparent cause. Once a loud report like a rifle shot resulted in a hurried and thunderous "take-off" by all the pelicans on the island. Looking in vain for human raiders, we decided that an addled egg had exploded from the heat of the sun. During our stay in the blind, most of the unhatched eggs were left uncovered in the warm sunshine much of the time, whereas the young birds were in many cases shaded from the sun by their parents. Very little feeding was accomplished during these hours. (See fig. 36.)

Approximately 500 young pelicans were banded by Marsh in 1932, 1933, and 1934. Returns have been obtained from localities throughout Mexico, the southern states, and the Middle West;

several returns from southwestern Canada indicate that some of the birds move northward after the nesting season.

Phalacrocorax auritus auritus. Double-crested Cormorant. Seven to twelve pairs have nested yearly on Woody Island among the pelican and heron nests; in 1932 and in 1934 one pair nested on Pelican Island. In 1935 two nests each contained small nestlings, appearing to be not more than two weeks old, on June 8; five other nests still contained eggs on June 10. The nesting season was somewhat earlier in 1932 and 1933, but it was later in 1934. Placed on the ground, the nests are built mainly of greasewood limbs and twigs woven into a compact cylinder eight to thirty inches high and about two feet in diameter.

Three cormorant nests, two with eggs and one containing young, were situated within sixty feet of the blind which we occupied for five and one-half hours on June 10, 1935. The two cormorants incubating eggs remained on their nests only about half of the time, flying away at intervals of about an hour. Generally we became aware of their return by hearing their hoarse, hog-like calls. The nest containing young birds was only about thirty feet from our blind, and for nearly two hours after we disappeared therein the adult cormorants did not alight at the nest, though they flew over the blind occasionally. After that time they visited the nest frequently, sometimes both remaining there at once. Occasionally they fed the young birds, or to be exact, allowed them to feed themselves. These three nests were all placed within a few feet of pelican nests, but no discord between the two species was noted.

About 35 young Double-crested Cormorants were banded by Marsh in 1932, 1933, and 1934; returns have been obtained mainly from Kansas, Oklahoma, Texas, and Louisiana.

Ardea herodias herodias. Great Blue Heron. Nests regularly on Woody and Pelican islands. About 200 adults were present in 1935, perhaps representing the average population; in the "peak" year, 1933, at least 500 birds were on the lake. The bulky nests of sticks are built on the ground or in clumps of greasewood. One or two nests are placed in a scrubby cottonwood on Pelican Island, the only "tree" on the islands. In 1935 about 60 nests were occupied on Woody Island, about seventy per cent of the eggs having hatched by June 10; the largest young were about one-third grown. Like the pelicans, the herons of Pelican Island showed a later stage of nesting than those on Woody Island. Of the 10 nests there, 5 contained eggs, 4 contained young birds, the largest probably not ten days old, and one nest contained one runt nestling and two runt eggs measuring about $1.00 \times .75$ inches and having the appearance of dried clay marbles. The season of nesting was somewhat earlier in 1934 and 1933, and considerably earlier in 1932.

During our stay in the blind from 8 a.m. to 1:30 p.m. on June 10, 1935, we had under almost constant observation about twenty heron nests that afforded a clear view of the nestlings. Desirous of securing photographs of the adult birds feeding their young, we watched closely for such an opportunity. But although the adult herons visited the nests at intervals, or remained there almost constantly, only once during the five-and-a-half-hour period was one seen to feed its young. The nestlings appeared contented and generally gave no indication of desiring food when a parent bird would return after an absence. Some adults remained at their nests almost constantly, shading their young from the warm sunshine during the hottest part of the day. (See fig. 34.)

Though the herons did not return to their nests near the blind, after we first entered it, as quickly as did the pelicans, after once returning they showed little fear of the unfamiliar object, often remaining at their nests while all the pelicans around them rose in sudden flight at some unexpected sound or motion.

About 350 young Great Blue Herons were banded by Marsh in 1932, 1933, and 1934. Returns have been obtained from localities in the Middle West, the southern states, and Mexico.

Botaurus lentiginosus. American Bittern. One bird was observed in the southwest arm of the lake on three different days in 1935. Recorded also in 1933.

Branta canadensis canadensis. Common Canada Goose. Occurs in small numbers, nesting on the islands and along the shores of the lake. In 1933 most of the eggs had hatched by June 18. In 1935 three full-exposed nests were found on Woody Island, containing 1, 4, and 6 eggs on June 8. The 5 eggs of a nest hidden in tall grass and rosebushes on Long Island hatched June 12; and 4 young a few days old were seen on the water with their parents, on June 8. These small young dived repeatedly as we pursued them in our canoe, readily swimming nearly a hundred feet at a time under water. When we discovered the nest on Long Island on June 8, four days before the eggs were to hatch, the goose remained hidden on its nest for several minutes while we tramped about in view nearby, not flushing until we approached within about twenty feet.

Anas platyrhynchos platyrhynchos. Common Mallard. Well distributed over the lake; nested commonly on Long Island and Woody Island in 1933, but no nests were found there in 1935. In 1932 most of the females had finished egg-laying on June 19; in 1933 some of the eggs had hatched

by that date. No young were on the water by June 13, 1935. Though thousands of Mallards were present in 1933, we estimated the number on the lake in 1935 to be about 100.

Chaulelasmus streperus. Gadwall. Abundant in 1933; large numbers were found nesting on Long Island. In 1935 our counts totaled 212 ducks of this species, it being twice as common as the Mallard, but being outnumbered more than two to one by the Redhead.

Mareca americana. Baldpate. Observed only in 1933 and 1935. Though in 1933 this species was perhaps the commonest duck on the lake, thousands being present, in 1935 we observed only a single pair. Hundreds of nests were found on Long Island and Woody Island in 1933.

Dafila acuta tsitsihoo. American Pintail. Common in 1932 and 1933; only six birds were observed in 1935. A few young had hatched by June 22, 1933; nests with eggs were abundant at that time on Long Island, and a few were found on Woody Island. The birds also occurred in large numbers in the southwest arm of the lake.

Nettion carolinense. Green-winged Teal. A lone male observed June 12, 1935, was the only bird seen during our four annual visits. In 1903 Willett found this species nesting abundantly on Woody Island.

Querquedula discors. Blue-winged Teal. Abundant in 1932 and 1933; many nests were found on Long Island in 1933. In 1935 about 200 occurred on the lake. The only nest found was located in tall grass about 200 yards from the southwest corner of the lake; the 10 eggs hatched June 13.

Querquedula cyanoptera. Cinnamon Teal. One pair was seen daily during the visit in 1933.

Spatula clypeata. Shoveller. About 80 birds frequented the west half of the lake in 1935. Several pairs were seen in marshes south of the lake in 1933.

Nyroca americana. Redhead. Abundant in 1933, especially in the southwest arm of the lake. Easily the commonest duck on the lake in 1935. Our counts placed the total number present as 480, more than forty per cent of the total duck population of the lake. In 1935 an exposed nest of this species, containing 9 eggs, was the only duck nest found on Woody Island. Another nest of 9 eggs was found June 12 hidden in the reeds on a tiny low-water island near the southwest corner of the lake.

Nyroca valisineria. Canvas-back. Abundant in 1933, especially in the southwest arm of the lake, which was that season well-filled with water. Common in 1934; only about 50 birds were present in 1935. Near the southwest corner of the lake that year we found a nest containing 10 Canvas-back eggs, 1 Redhead egg, and 1 egg of uncertain origin, probably an undersized Canvas-back egg that may have been deposited by a second female of that species. Situated in six inches of water, the nest was built up with rush stalks to a height of eight inches above the lake surface. We approached this nest on three different days, and in each instance flushed a female Redhead from the nest. The eggs had not hatched by June 12.

Nyroca affinis. Lesser Scaup Duck. A total of about 20 birds frequented the west portion of the lake in 1935. In 1932 a pair nested on an island in Nelson Reservoir.

Erismatura jamaicensis rubida. Ruddy Duck. In 1935 8 or 9 pairs occurred regularly in the southwest arm of the lake, in the vicinity of heavy growths of bulrushes. The soft bottom and shallow water prevented a search for their nests either afoot or with our canoe. Birds of this species were plentiful in 1933, in the same part of the lake, but none was observed in 1932 or 1934.

Buteo swainsoni. Swainson Hawk. Not common; seen near the east shore of the lake in 1933; one was seen there June 12, 1935, and two were observed near Malta the same day.

Buteo regalis. Ferruginous Rough-leg. Not common; observed near the lake on two days in 1935.

Circus hudsonius. Marsh Hawk. Uncommon; observed in 1933; one bird coursed the southwest arm of the lake on three successive days in 1935.

Falco mexicanus. Prairie Falcon. Rare; one bird was seen at the lake daily from June 9 to 12, 1935.

Pedioecetes phasianellus campestris. Prairie Sharp-tailed Grouse. Two birds were flushed from Woody Island in 1934.

Centrocercus urophasianus. Sage Hen. A female with a brood of young was seen in 1933 near the clubhouse, west of the lake.

Perdix perdix perdix. European Partridge. A few occur near Malta. Two were flushed from Woody Island, June 8, 1935.

Phasianus colchicus torquatus. Ring-necked Pheasant. Fairly common near Malta, on irrigated farms and along the Milk River.

Porzana carolina. Sora. Both in 1933 and 1935 a bird was heard several times in the bulrushes near the clubhouse, and was seen briefly a few times.

Fulica americana americana. American Coot. In 1935 a few pairs inhabited the southwest arm of the lake, where cover was plentiful; 35 birds were counted June 9 during a circuit of their

grounds. No nests could be seen from the margins of the rushes, and no young birds were on the water. In 1933 several hundred coots inhabited that part of the lake, and numerous nests were found.

Oxyechus vociferus vociferus. Killdeer. Occurs regularly along the shores and occasionally on the larger islands. Our count in 1935 totaled 66 individuals.



Fig. 35. Typical bulrush growth along southwest shore of Lake Bowdoin, showing two Avocets and a pair of Wilson Phalaropes at a favorite feeding ground. Photographed June 7, 1935.

Capella delicata. Wilson Snipe. One bird was seen along the west shore in 1933.

Numenius americanus occidentalis. Northern Curlew. A few pairs occur along the north shore and locally on the surrounding prairies.

Actitis macularia. Spotted Sandpiper. Occurs in small numbers. Nests containing eggs were located in 1933 and 1935. In 1935 about 20 birds frequented the north shore; one pair was seen regularly on Long Island, and five pairs were noted on Woody Island.

Catoptrophorus semipalmatus inornatus. Western Willet. Occurred in small numbers along the shores every season. Less common than usual in 1935, our counts placing the number seen as not more than 12.

Pisobia minutilla. Least Sandpiper. A bird thought to be a Least Sandpiper was seen June 17, 1934. On June 8, 1935, a bird probably of this species was seen on Daddy's Island. Though we both examined it with binoculars, we were not favored with a view close enough to make identification certain.

Limosa fedoa. Marbled Godwit. Occurs regularly in small numbers, mainly along the north shore. Only about 10 birds were seen in 1935.

Crocethia alba. Sanderling. A pair was found on Woody Island in 1933; one was collected by Marsh.

Recurvirostra americana. Avocet. Fairly common along the shores and on most of the islands. In 1935, there were 5 nests on Daddy's Island, 3 containing 4 eggs each and 2 with 3 eggs each. The sets were complete before June 8, and no eggs had hatched by June 13. On Avocet Island by June 8 there were 5 nests, each with a set of 4 eggs. One nest contained 2 eggs and another nest 3 eggs and a Common Tern egg, on June 11. A young bird, probably not more than three days old, was seen on the land and also was seen swimming in the water, June 11. Two pairs of adults were present on Pelican Island; no birds were seen on Woody Island, where Willett found large numbers nesting in 1903, though several nests were found there in 1934. (See fig. 35.)

The nests are placed on gravel beds, a shallow depression in the ground being lined with dried feathers and fish bones. The nest lining material matches the gray color and general appearance of

the gravel beds more closely than do the rather dark, heavily-spotted eggs. In looking for nests, it is the eggs themselves that catch the eye, and at a distance there appears to be no nest.

Steganopus tricolor. Wilson Phalarope. Of regular occurrence, feeding almost entirely while wading or swimming in shallow water close to the shore. One pair in 1935 fed daily in a small opening among the bulrushes a few yards from our camp near the clubhouse site, often being there by sunrise in the morning and in the evening lingering until deep twilight. A number of pairs nested on Long Island in 1933.

Larus argentatus smithsonianus. Herring Gull. A few gulls of this species were observed in all four seasons, occurring with those of the following three species. One bird was collected by Marsh in 1933 to make identification certain. About 10 birds were distinguished in 1935 at Woody Island; on June 8 we found a nest of 3 eggs (1.94×2.88 inches) among nests of California and Ring-billed gulls.

Larus californicus. California Gull. Breeds regularly in small numbers on the islands. The bill and wing feathers of a dead bird found in 1933 were sent to Dr. J. Grinnell, who confirmed the identification. We estimated the total number present in 1935 as about 60 birds. Several nests containing two or three eggs were located on the northwest point of Woody Island; a nest of three eggs was found among Avocet and Common Tern nests on Daddy's Island; and three young gulls perhaps a week old, at Avocet Island, were attended by adults of this species. Measurements of several sets of eggs ranged from 1.62×2.31 to 1.87×2.62 inches.

Larus delawarensis. Ring-billed Gull. A common breeding bird, varying somewhat in numbers from year to year. The lowest population during our visits was reached in 1935, when probably 1000 birds inhabited Woody Island. Two large colonies that year occupied the northeast and south points of Woody Island, and a few pairs nested with California and Herring gulls on the northwest point. The nests varied in structure from scantily-lined depressions in the ground to mounds of grass and small sticks ten to fifteen inches across, built up three or four inches in height. The season's hatch was approximately eighty per cent completed by June 8. Most of the nestlings took to the water when disturbed, some swimming out from the island more than a hundred yards. The gulls have varied less from year to year in the time of nesting than have the pelicans and herons.

On the afternoon of June 8, 1935, we spent five hours in a covered burlap blind in the midst of the colony on the northeast point of Woody Island. Unlike the pelicans, herons and terns, the Ring-billed Gulls remained constantly aware of our presence in the blind, and did not approach closer than about forty feet, even after five hours of safety. Several broods of young were scattered about the ground near our blind and we hoped that these would draw their parents within closer range of our lenses, but the opposite occurred. By dint of much pleading and scolding and momentary sallies toward the young, the adult birds from a safe distance succeeded in coaxing their nestlings to them. Within an hour only a few of the young birds nearest our blind remained within sixty or seventy feet of us. One high rock, a favorite perch of the gulls of that colony, stood about thirty feet from the blind. During the afternoon a number of birds started to alight on it, but their courage always failed them before they came to a full rest.

On another day a gull was observed pirating his dinner from White Pelicans on Woody Island, by fluttering a few feet from a pelican's head and loudly scolding or begging until the pestered bird would strike at the gull with its beak. Occasionally this action by the pelican would be accompanied by the disgorgement of a fish, which would be promptly seized and carried off by the gull.

The gulls scattered widely over the farmlands north and west of the lake to feed. Small flocks regularly returned to the islands just before dark in the evening. Generally, upon reaching the west shore of the lake, they would drop down to within a few inches of the surface and fly across the lake at that level.

About 450 young gulls have been banded, with very few returns. Though about 200 young birds were banded in 1934, we saw not a single banded bird among the several hundred gulls observed there at close range the following year.

Larus pipixcan. Franklin Gull. A few pairs of gulls believed to be of this species rather than the following one, but not identified positively, were found apparently nesting in the southwest arm of the lake in 1933. Their nesting site could be approached only within fifty yards; 6 birds were counted at one time.

Larus philadelphia. Bonaparte Gull. Three birds of this species were observed closely for half an hour in June, 1932, near the southwest shore. A single bird of this species or of the preceding one was observed June 9, 1935.

Sterna hirundo hirundo. Common Tern. Occurs regularly but in varying numbers, nesting on some of the islands and feeding both at the lake and on the nearby farmlands. Common also at Nelson Reservoir. The breeding population at Lake Bowdoin was largest in 1932, when the lowered

level of the lake exposed several small sandy islands suitable for nesting areas. The birds nest peaceably among avocets, gulls, ducks, and geese, favoring the exposed beaches with scant cover. A shallow depression in the sand or gravel, usually bare, but sometimes lined with grass, reed-stalks, and feathers, receives the two or three eggs, which exhibit considerable variation in color. In 1935, 15 nests on Avocet Island contained 1 to 3 eggs each by June 11; of 13 nests on Daddy's Island, 5 contained 1 egg each on June 13, the rest 2 eggs each; about 25 nests on Woody Island contained 1 to 3 eggs each on June 8. The stage of nesting was similar in 1932 and 1933, but in 1934 most of the Common Tern eggs had hatched or were hatching by June 17.



Fig. 36. A small section of the White Pelican colony on Woody Island. Photographed June 10, 1935.

We found the Common Tern to be less disturbed by our visits and blinds than any other species on the lake. On Avocet Island we found it necessary to erect our blind within four to six feet of three of their nests in order to keep a safe distance from Avocet nests. Within half an hour after we entered the blind the morning after its erection, however, terns had returned to all of these close nests, and throughout the morning they appeared to regard sounds and movements within our blind and the lenses thrust toward them with more curiosity than alarm. Often while one bird covered the eggs, its mate stood nearby, preening its feathers or resting, with no fear of the photographers that were recording its actions from a few feet distant. Meanwhile the Avocets often left their eggs uncovered with perfect safety; one set of eggs, in fact, in a nest also containing one tern egg, was covered part of the time by a Common Tern.

Chlidonias nigra surinamensis. Black Tern. Occurs in varying numbers. Common in 1933, nesting along the east shore of the southwest arm. In 1935 about 25 birds frequented the north side of the lake, making Avocet Island their resting place, but not nesting there at that time. Occurs also at Nelson Reservoir.

Zenaidura macroura marginella. Western Mourning Dove. Occurs in small numbers near Malta.

Chordeiles minor sennettii. Sennett Nighthawk. A few were seen over the lake. One evening at dusk as a nighthawk was feeding in erratic flight near our camp, a flock of Common Terns came in from the west and flew straight out over the lake. The nighthawk darted over to fall in line just at the front of the flock, and held this position with unwavering flight as long as the birds could be seen with binoculars.

Tyrannus tyrannus. Eastern Kingbird. Fairly common near Malta and about the farms.

Tyrannus verticalis. Arkansas Kingbird. One was observed between the lake and Malta in 1935.

Sayornis saya saya. Say Phoebe. A pair nested at the clubhouse in 1932 and 1933. A male remained at the same site all during our visit in 1935. The clubhouse itself was moved from the grounds the day we arrived, and it may be that a female bird and her nest accompanied it.

Otocoris alpestris leucolaema. Desert Horned Lark. Common on the prairies in the vicinity of the lake.

Iridoprocne bicolor. Tree Swallow. One was seen over Nelson Reservoir, June 12, 1935.

Riparia riparia riparia. Bank Swallow. A few breed in suitable banks near the lake. One of three occupied nests below the spillway from the canal contained 6 eggs on June 12, 1935.

Stelgidopteryx ruficollis serripennis. Rough-winged Swallow. A few pairs nest locally, near the lake.

Hirundo erythrogaster. Barn Swallow. A few pairs nest yearly on bridges near the lake. A nest on the concrete culvert where the highway crosses the canal spillway contained 4 eggs on June 12, 1935.

Pica pica hudsonia. American Magpie. Rare. A few birds were seen about a mile west of the lake in 1935.

Corvus brachyrhynchos hesperis. Western Crow. Rare; not seen at the lake. A few were seen near Malta on one day in 1935.

Telmatoodytes palustris plesius. Western Marsh Wren. One was observed in the southwest arm of the lake in 1932.

Turdus migratorius propinquus. Western Robin. Not common; a few nest in Malta and about the farms.

Sialia currucoides. Mountain Bluebird. A pair was staying at the clubhouse grounds in 1933.

Lanius ludovicianus excubitorides. White-rumped Shrike. One was seen near the lake in 1933.

Dendroica aestiva aestiva. Eastern Yellow Warbler. A few were observed in Malta.

Geothlypis trichas occidentalis. Western Yellow-throat. Occurs commonly all along the southwest arm of the lake, inhabiting the bulrushes and the sedges and grasses near the shore.

Passer domesticus. English Sparrow. Common about the farms and towns.

Sturnella neglecta. Western Meadowlark. Common on the bottomlands along the Milk River. Rare near the lake. A singing male visited Woody Island for several minutes one day in 1935.

Xanthocephalus xanthocephalus. Yellow-headed Blackbird. Three or four hundred pairs nest among the rushes in the southwest arm of the lake. Occurs also in suitable sloughs and marshes throughout that locality. On June 12, 1935, we explored an acre of the bulrush growth in shallow water near the clubhouse site to determine the stage of nesting of this species. Twenty-seven nests were found in this area. Six nests were completed but contained no eggs; there were 2 nests with 1 egg each, 2 with 2 eggs, 5 with 3 eggs, 6 with 4 eggs; in 1 nest the eggs were hatching; 1 nest contained dead nestlings; and the remaining 4 nests contained 2 to 4 young birds about 1 to 4 days old.

Agelaius phoeniceus arctolegus. Giant Red-wing. Common every place on the lake that rushes grow. In 1935 there were four pairs on Long Island, about 150 birds on Woody Island, and about 250 birds along the north and west shores. This species occurs commonly in the surrounding country wherever suitable nesting sites are available.

Euphagus cyanocephalus. Brewer Blackbird. A small flock was seen on the south shore of the lake in 1935.

Calamospiza melanocorys. Lark Bunting. Common locally throughout the region.

Passerculus sandwichensis nevadensis. Nevada Savannah Sparrow. Breeds commonly along the shores of the lake and on Woody Island.

Poocetes gramineus confinis. Western Vesper Sparrow. Occurs rarely near Malta.

Chondestes grammacus strigatus. Western Lark Sparrow. One was observed near the lake in 1933.

Melospiza melodia juddi. Dakota Song Sparrow. One bird, presumably of this subspecies, was seen daily in 1933 near the clubhouse.

Rhynchophanes mccownii. McCown Longspur. One was seen near the lake shore in 1935.

Calcarius ornatus. Chestnut-collared Longspur. The commonest land bird in the region, occurring everywhere on the untillied prairies and commonly about the farms. Three nests containing eggs were found along the northwest shore of the lake on June 11, 1935.

Fortine, Montana, March 25, 1936.

THE HUNTER IN SOUTHERN CALIFORNIA VERSUS WILD ANIMAL LIFE

By W. LEE CHAMBERS

My yearning for birds began in 1891, when I became interested in wildlife in general. From 1892 to 1894, I was associated with the group of young ornithologists which formed the Southern California Natural History Society which later became the Southern Division of the Cooper Ornithological Club. This association was a great stimulus for me.

In 1894 my family moved to Santa Monica where the country was still wild and game was abundant. At this new location I had wonderful chances to watch huge flocks of wildfowl. I will never forget how we watched in the fall for the flocks of Cranes which came to feed on the barley in fields that extended from the present site of Wilshire Boulevard to the foothills, an area nearly four miles long and one and one-half miles wide.

We also saw occasional flocks of Mountain Plover. These birds generally accompanied large flocks of Killdeer, apparently for sociability. But what thrilled me most were the long clouds of ducks and geese on migration. I have seen ducks and geese in thousands covering the ocean off the present site of Playa del Rey and on the lagoons back of there. This area was called Ballona Swamp. In rainy winters Ballona Swamp extended over nearly all the low ground as far back as the present site of Culver City, then called "The Palms," and running over to the Inglewood Mesa, an area about ten miles square. Apparently it was one of the resting places of the migrating flocks. Often I stayed awake to listen to the continuous calls of the flying birds. These sounds, which were music to me, will never be heard again by anyone there, for nearly all the marshes have been drained and the place is almost solidly filled with houses. Human progress has wiped out this bird paradise.

The Santa Monica Mountains swarmed with coveys of Valley Quail, and deer were abundant. Every group of large sycamores was ruled by a Red-tailed Hawk or a Swainson Hawk. Hollow trees housed numerous Sparrow Hawks, Barn Owls, and Screech Owls. Everywhere, in season, we could hear the cries of woodpeckers, Flickers, Western Kingbirds, and Bullock Orioles. Smaller birds were abundant, making this a wonderful place for me; the years 1894-1895 passed rapidly.

One of the outstanding spots in my memory was the taxidermy establishment of Mr. and Mrs. John Brickner. Along in the middle 1890's they sold enormous quantities of small, mounted birds for millinery purposes. Hummingbirds were very common throughout this section and the Brickners caught most of their hummers by netting them. With Mrs. Brickner's unusual skill as a taxidermist, these gorgeous birds were beautifully mounted on long stickpins or on wires. It was common to see hundreds of these mounts pinned on a large slab of redwood bark, so lifelike they seemed about to fly away. I remember one lady in Santa Monica who had a quantity of these beautiful creatures pinned on her hat. She looked like a walking aviary!

In the summer of 1896, my father purchased for me an interest in a retail hardware store in Santa Monica, and it was my job to manage the sporting goods department, as we called it; the only items sold were guns, ammunition, and fishing tackle. Shotgun shells in our stock were mostly 10 and 12 gauge and the metallic cartridges were mostly .25-20, .32-20, .38-55, .38-40, and .44-40, all slow cartridges, powerful enough to kill deer but not to carry for a long shot; they gave the deer a chance.

About this time the Winchester people developed the first high power sporting rifle, the old 1894 model Winchester with its .25-35, .30-30, and .32 special loads. We thought these guns were great and they were popular, enormous quantities being sold. The Winchester 1895 model lever action army gun became popular early in 1897, and it was one of the most destructive machines against wildlife ever put on the market.

In the summer of 1897 we sold our interest in hardware and opened a sporting goods store fully equipped with implements for the destruction of wildlife. Up to this time and through 1898 there was no bag limit, and closed seasons were the only curtailment on hunting. Open seasons for birds in the California game laws for 1897-1898 were as follows:

Valley Quail, Bob-White, Partridge, Wild Ducks, Rail—October 1 to March 1.
Mountain Quail and Grouse—September 1 to February 15.
Doves—July 15 to February 15.

Market hunting was in full swing, but at that time there were not many market hunters and the game was plentiful. If I remember correctly, ducks brought only 25 cents each and quail 5 cents. Nevertheless, I have seen market hunters drive up in front of the store with a light buckboard literally heaped with quail or ducks.

Shortly after 1898 many new high power rifles came out and the market was flooded with them. Before the advent of these guns in so many models and patterns, hawks, owls, and other large birds were fairly safe and they were seldom molested. It seemed that everyone who purchased a new high power rifle had to target shoot, and it was the common practice for purchasers to go out in the wilds and shoot everything they could see in an effort to improve their marksmanship. It was not long until we noticed a decrease in the hawk and owl population. Many of the birds so killed were brought to my store; among them were two California Condors.

Beginning in 1899 the Fish and Game Commission gradually curtailed hunting privileges, and correspondingly the hunters developed the tendency to target shoot everything in sight. A duck hunter would practice on coots, gulls, cormorants and herons, and the deer hunter would try his luck on hawks, condors, owls, woodpeckers, or anything else he could see to shoot. The birds were no longer brought to my store, but the shooting continued in greater amount than ever.

A very excited man came to my store about February 25, 1900, and told of thousands of wild pigeons (*Columba fasciata*) being poisoned on the Wolfskill Ranch. The pigeons were eating the grain faster than it could be sowed and harrowed, and the ranch people had scattered some poisoned grain which was killing the birds. I had never seen wild pigeons, so I hurriedly rode my bicycle to the ranch which was near the present site of Sawtelle, then a large barley field.

When I arrived at the field I saw a large flock of Turkey Vultures feasting on the dead pigeons, the remains and feathers of which covered a large part of 160 acres. I gathered all the perfect birds I could carry in two sacks and rode back to Santa Monica. Harry Swarth made these into beautiful specimens for me on a fifty-fifty basis.

It is impossible for me to estimate how many Band-tailed Pigeons were poisoned, but the original flock must have been a large one. The poisoning and the vulture feast went on all day: I was present only at the end of the incident. As far as I know this never happened again in the Santa Monica area, and my notes do not mention pigeons again up to the time I moved from there.

In 1905, I sold my sporting goods store and started to work for the Wm. H. Hoegee Company of Los Angeles, one of the largest distributors of guns and ammunition in the United States. As a traveling salesman I went regularly over the southern half of

California, and I became acquainted with every retail sporting goods store and its personnel in this district. I listened to many tales of practice shooting. In Imperial Valley in the early days Burrowing Owls made excellent targets; a favorite Sunday "sport" was the shooting of "Billy Owls" with the result that this interesting little fellow was so persecuted that it is now too scarce to furnish the sport. But if the owl increases sufficiently, the shooting will be resumed.

Another favorite day's work for the "sportsman" was "plunking" pelicans as they sailed over Salton Sea. The object was to see who could hit the greatest number of this majestic bird. Rifles were used in this sport, but sometimes shotguns were employed. When pelicans were not flying, any bird that happened by was the target. Pelicans are now scarce on Salton Sea, so this sport is dead.

This target shooting is encouraged by the ammunition companies in their so-called "pest drives." To be sure, these companies designate Horned Owls, Sharp-shinned and Cooper hawks, and Crows as vermin, and they encourage the offering of prizes for the most pests killed on these vermin drives. The topic is so big and there is so much to be said about the "pest" drives that I will leave it for another time.

Here is where the harm comes to the wildlife. Mr. Average Sportsman today buys a nice new, high-powered rifle and is given literature on vermin and pests, or he reads about these in the game and hunting magazines. On his trip out in the country on little-traveled highways he sights a hawk on a telephone wire and, although it is against the law to shoot from a public highway, he sees no one about and takes a bead on the bird, which he generally shoots and leaves where it falls. If he drives off the highway to a sparsely inhabited country, he may spend an hour in one spot, shooting any bird that comes in range of his rifle. When this territory is exhausted he moves a few miles farther and repeats the slaughter. I wonder how long our avian population can stand this destruction. It must be remembered this hunter is only one of approximately 200,000 in California legally entitled to target shoot, and it is seldom that anyone is arrested for this kind of shooting.

A new factor in bird destruction is the new "hopped up" .22 caliber ammunition. Guns have been remodeled to take care of these new high power cartridges, and about thirty-five new models of .22 rifles have appeared within the last six months. A great many models are coming out regularly equipped with telescope sights. These new guns are being advertised extensively by the factories, and the sporting goods stores are making a nice profit. This .22 rifle business has increased about 25 per cent during the last two years and the profit is very acceptable to the sporting goods stores.

All this means more targets will have to be found. Birds, animals, road signs, insulators, rocks and anything in sight will be used. The worst drain naturally will fall on our avian friends. The sporting goods dealers know this is a common Sunday sport and encourage it, although they know that thousands of protected birds are killed in this manner. A great many hunters (or target shooters) know it is illegal to shoot everything in sight, but there are not enough game wardens to give the country the protection from this vandal shooting which it should have. Anyone who has driven along the highways has noticed that many road signs are shot so full of holes that they are ruined. Ask the Auto Club what they think of these vandals. Quite recently some target shooters tried their skill on tanks used for water storage to fight forest fires, and shot them full of holes. This kind of shooting in a way helps the conservationist, for it brings the vandalism before the authorities in a forceful manner.

The following paragraphs are very much to the point and are taken from an editorial in the January Nature Magazine (vol. 27, 1936, p. 42). Quotations are from Mr. Jay N. Darling's remarks in another publication.

"No major sport in the world (with the possible exception of the wrestling game," he said, "has suffered so much from abuses within as the time-honored recreation of wild-fowling. The boys like it so well they've about ruined it. . . .

"Speaking by and large, everything goes in the great conglomerate fraternity of those who take fish and game by fair means or foul. Nothing is barred. You may shoot out of season, exceed the bag limit, buy ducks of a bootlegger, bribe a game warden, have your Senator intercede with the judge, and still be accepted in good sportsmen's society. If you can carry home one bag limit in the open, hide a gunny sack full under the seat cushions, and stuff another dozen in your spare tires and get as far as the club ice-box with them, it's heigh-ho and a great joke on the Fish and Game Department. You can tag one possession limit for yourself, another for each one of your business associates and one for the village dog-catcher—just so they are out of your possession—and still call yourself a sportsman. Ducks by the thousands trapped, shot on the water at night, shipped in eel kegs to hotels, commission houses and night clubs—are bought by the gentry of the sportsman's world with no resulting stigma. Baited slaughter pens with a guaranteed bag limit to all comers for \$25 and a photograph of yourself with Charley, the guide (who shot them), go unchallenged in respectable circles."

This is plain speaking from a man who knows and to whom the gunners can scarcely refer with their usual sneer: "Bah! Sentimentalist." Mr. Darling further points out that there appears to be no penalty for hitting below the belt or fouling "in the realm of those who hunt and fish and call it sport." Everyone will agree with Mr. Darling when he says that "there are, of course, fine sportsmen." But, he adds, they "give a good name to many a racketeer whose abuses of the sport are responsible for the restrictions visited upon all alike."

Mr. Darling even cites one of our leading wealthy sportsmen who, finding the duck-shooting regulations onerous, finances a duck census to prove that those who contend there is a duck shortage are fools, and seeks "to organize a revolution against all those who stand in the way of the inalienable right of every American to shoot when and how he pleases." And, at that, we have a feeling that Mr. Darling has left a lot unsaid.

I had the honor and pleasure to have known very well the late Dr. E. W. Nelson, when he was Chief of the Biological Survey. He, also, was of the opinion that the hunters would, if left the opportunity, eventually shoot everything which would fly within their range. I have been active in selling guns and ammunition since 1896, in the lower half of the State of California, and have had the good fortune to be associated with scientific ornithologists as well as hunters; so I feel qualified to endorse for my territory Mr. Darling's statements as to the average man with a gun.

In connection with my pessimistic predictions please remember that in southern California from 1891 to 1936 some of our birds and animals have already disappeared and many are now making their last stand, and most of the ones left are but pitiful remnants of the former numbers.

As this article is being finished another deer season has started in California. The past three weeks have broken all our records for the sale of deer rifles and ammunition. Every jobbing house in southern California has the same report. This means a big addition to the practice-shooting fraternity. These new rifle owners will have to find targets!

I am criticising no one person, but I do blame the primitive instinct in man to pursue and destroy, and I firmly believe that the future of birdlife in this territory is doomed unless something is done to stop the tremendous slaughter by target, or practice, shooting. Large sanctuaries offer the only positive protection, and outside them everything larger than a sparrow is destined for destruction.

Eagle Rock, California, June 1, 1936.

DESCRIPTION OF A NEW RACE OF *CARPODACUS MEXICANUS*

By ROBERT T. MOORE

In collections from Sinaloa have appeared specimens of a new race of the House Finch which I am herewith describing. For the loan of material my thanks are gratefully given to Dr. Barbour and Mr. Peters of the Museum of Comparative Zoology, and to Dr. Friedmann of the Smithsonian Institution, and also to Dr. Oberholser of the Bureau of Biological Survey for the loan of the type of *Carpodacus mexicanus sonoriensis*. All capitalized names of colors in this paper are taken from Ridgway's "Color Standards and Color Nomenclature."

***Carpodacus mexicanus rhodopnus*, new subspecies. Sinaloa House Finch**

Type.—Nesting male adult; number 9413, collection of Robert T. Moore; original number 19735; El Molino, on seacoast twenty-five miles southwest of Culiacan, Sinaloa, Mexico; May 26, 1934; collected by Chester C. Lamb.

Subspecific characters.—Smallest and most extensively red of all the races of *mexicanus*; entire under parts, including under tail coverts, under wing coverts, axillars, as well as back, rump and tips of upper tail coverts, suffused with various hues of red. Nearest to *Carpodacus mexicanus ruberrimus* Ridgway and birds of southern Sonora hitherto known as *Carpodacus mexicanus sonoriensis* Ridgway, but breeding birds of *rhodopnus* differ from breeding birds of both in being smaller and darker, having throat, jugulum and abdomen blotched with Carmine instead of Nopal Red to Rose Red, and red more extensive; under tail coverts almost completely unstreaked white, suffused with Jasper Red, instead of streaked white without suffusion; rump and forehead darker red, crown darker brown. Fall birds in fresh plumage have underparts darker, Dark Vinaceous to Hydrangea Red, instead of Corinthian Red; upper parts also darker. Females have mixed yellow and brown, or red and brown, or yellow, red and brown rumps; late fall females have suffusion of yellow or pink on jugulum and abdomen, and color of rump intensified. I have not seen *potosinus*, but obviously *rhodopnus* differs still more sharply from this form, as well as from *nigrescens* and *mexicanus mexicanus* of eastern Mexico, by absence of brown streaks, greater extension of red on underparts and much smaller size.

Range.—Arid Tropical Zone of central Sinaloa along coast, extending as far north as Guamuchil on Rio Mocorito and possibly south to Mazatlan, and east in cultivated valleys to foothills of main range of Sierra.

Remarks.—The thirty-three available specimens come from El Molino, Culiacan, Reforma and Guamuchil. Specimens from Ahome and Yecorato in extreme northern Sinaloa are variously intermediate. I suspect that when an adequate series is collected between Ahome and Guamuchil, the Rio Mocorito, or some approximating line, will prove to be the northern boundary of the race. South of Culiacan *rhodopnus* is absent or rare. In three years of collecting, Chester C. Lamb has observed only one individual, a doubtful sight record, at Mazatlan. In the spring of 1936 the author saw none at La Union, Concordia or Panuco, considerable towns where it might be expected. This apparent hiatus in the range of the species extends for a distance of two hundred miles and overlaps the boundary of the state of Nayarit possibly as far as the vicinity of Tepic. An explanation of it may be found in the change of flora and topography. Both *frontalis* of southern Arizona and so-called *sonoriensis* of Sonora are confined to towns and villages of the cactus plains and deserts. These conditions extend southward along the coastal plains on the east side of the Gulf of California for seven hundred miles without conspicuous floral change as far as Culiacan in central Sinaloa. From about this point southward some important modifications occur. The interstices between the huge cacti become jammed with an impenetrable mass of brush, and near Mazatlan coconut palms begin to dominate the landscape. Finally, at the Nayarit border the mountains come down to the coast, and, joining the mangrove swamps, interpose an effective barrier to low coastal races.

In the mountain towns of Nayarit and Colima a very different high-plateau race occurs. Scattering specimens from these states and Michoacan agree with five specimens from Durango, and thirteen specimens from Jalisco, in exhibiting much larger measurements, more vivid color of underparts, approaching Scarlet, extension of Scarlet to upper abdomen only, and heavy streaks on the latter. These birds were formerly known as *rhodocolpus* (Cabanis), but recent investigation by van Rossem (Bull. Mus. Comp. Zool., vol. 77, 1934, pp. 419-420) have proved this name invalid. They are closer to *frontalis* of southern Texas than to *rhodopnus*. When more specimens are avail-

able, it may be found advisable to group them with the large and extensively scarlet birds of Guanajuato under a new subspecific name, unless the darker race, *Carpodacus mexicanus potosinus* Griscom of San Luis Potosi, may include them satisfactorily.

Specimens examined.—Sinaloa (*rhodopnus*), 36; southern Sonora and extreme northern Sinaloa (*frontalis* × *rhodopnus*), 59; Lower California (*ruberrimus*), 25; western United States from Oregon to Colorado, and California to Texas (*frontalis*), 482; Santa Cruz Island (*frontalis*), 17; San Clemente Island (*clementis*), 71; Santa Barbara Island, Catalina Island, Los Coronados Islands and San Nicolas Island (*clementis*), 94; San Benito Island (*mcgregori*), 5; Guadalupe Island (*amplus*), 8; birds formerly known as *rhodocolpus*, Durango 5, Jalisco 14, Michoacan 1, Colima 1, Guanajuato 7; true *mexicanus mexicanus* from Distrito Federal 9, Hidalgo 6, Morelos 1, Puebla 4, Guerrero 26; *m. roseipectus* (?) from Oaxaca 2; *nigrescens* from Tamaulipas 1.

The important variations in intensity, streaking and recession of color on the long-enduring feathers of *Carpodacus mexicanus*, unrelieved by a spring molt, render winter-taken birds of little value for taxonomic purposes. (For a pains-taking study of these variations, see Harold Michener and Josephine R. Michener, Condor, vol. 33, 1931, pp. 12-19; also see Grinnell, Univ. Calif. Publ. Zool., vol. 7, 1911, pp. 179-195.) It is fortunate, therefore, that in this excellent series of thirty-six specimens of *rhodopnus*, eleven males and seven females are breeding, nesting birds, the females upon dissection having shown eggs in the oviduct.

Considering the females first, the frequently bright color of the rump seems to be an important character. Generally this color is yellow, but sometimes it is red and occasionally mixed red and yellow. It must not be confused with the buff of immatures of both sexes, present apparently in every known race. This buff disappears in the adult plumage. Red or yellow of the rump seems to be incipient in nearly all races, although generally, as in *frontalis*, consisting of rare traces, requiring microscopic inspection. Conspicuous rump color is absent or rare except in *ruberrimus* (14 per cent), so-called *sonoriensis* (40), and *rhodopnus* (73). *Rhodopnus* is the only race in which every female shows at least some trace of color.

Male breeding birds of *rhodopnus* are uniform in color of the underparts, and the full extension of red coloration is maintained both in worn breeding birds of May and June, and in winter specimens. This stands out in decided contrast with *ruberrimus* and *sonoriensis*, in which forms a recession occurs in the red areas, progressively from the fall until the breeding season, by the gradual destruction of the red barbs and barbules. A microscopic study of the feathers, not only of *rhodopnus* but also of hundreds of specimens of *ruberrimus*, *sonoriensis* and *frontalis*, proves this conclusively. This recession of the red areas is no new discovery and credit must be given to the Micheners (*loc. cit.*), who noted the process while examining 1563 banded live *frontalis* of California. Many individual birds were recaptured a number of times by them and the feather changes recorded. The present author has extended their study to the underparts and included *ruberrimus*, *sonoriensis* and *rhodopnus*. The accompanying table gives the results graphically and shows the great contrast of the three northern forms with *rhodopnus* in every effect of feather wear, except intensity. Specimens have been grouped according to the months in which they were taken and the fact made of use, that maximum-colored individuals in the northern races show their increase of red by an extension posteriorly on the underparts. By selecting only those birds which show red on the most posterior parts and comparing this maximum extension by critical months, a reliable average is obtained for each race. Incidentally this method probably eliminates all birds which are not fully adult, since the Micheners have shown that maximum extent of color is correlated with increasing age.

CORRELATION OF WEAR ON UNDERPARTS OF MALES WITH INCREASED INTENSITY OF REDS, INCREASED APPEARANCE OF STREAKING, AND RECESSION OF RED AREA

	September- December	January- February	March- April	May- June
Percentage of males showing intense red coloration				
<i>ruberrimus</i>	0	0	88	100
<i>sonoriensis</i>	0	40	80	100
<i>rhodopus</i>	0	50	67	100
Percentage of males showing obvious streaking				
<i>ruberrimus</i>	71	100	88	100
<i>sonoriensis</i>	64	80	90	100
<i>rhodopus</i>	0	0	0	0
Percentage of males showing complete extension of noticeable red to under tail coverts				
<i>ruberrimus</i>	71	0	25	0
<i>sonoriensis</i>	55	0	10	0
<i>rhodopus</i>	100	100	100	100
Percentage of male <i>frontalis</i> showing complete extension of red to and including upper abdomen				
<i>frontalis</i>	64	37	42	23

Numbers of males examined in compiling the averages in this table: *Carpodacus mexicanus ruberrimus*, 18; *Carpodacus mexicanus sonoriensis* (?), 30; *Carpodacus mexicanus rhodopus*, 20; *Carpodacus mexicanus frontalis*, 85. Three-fifths of the specimens of *frontalis* in March and April were only slightly worn, still showing delicate whitish tips to breast feathers.

Turning to other characters, the rump of *rhodopus* averages darker than either *ruberrimus* or *sonoriensis*, approximating Nopal Red as compared with Scarlet-Red to Scarlet. The forehead also averages slightly darker. Fall birds, October to November, are slightly darker and grayer above than *sonoriensis* or *ruberrimus* of the same months; they are decidedly darker than the birds of Durango and Jalisco.

The almost complete lack of streaking of the under tail coverts and abdomen of *rhodopus* is one of its most outstanding characters. In this it differs quite as markedly from its nearest relatives, *ruberrimus* of Lower California and the birds of Sonora, as it does from all other races of *mexicanus*. Eight out of the eleven breeding *rhodopus* have no streaks, and the other three exhibit only vestigial remnants of obscure shaft streaks, whereas all nine breeding *ruberrimus* and all twelve *sonoriensis* have conspicuous streaks. The only exception in this contrasting picture is a single specimen from Guamuchil on the southern boundary line of the area of intergradation in northern Sinaloa. This bird, having many of the characters of *sonoriensis*, including a streaked, whitish abdomen and long culmen, was taken in the middle of March and may be a migrant from the north.

With regard to fall and winter males, all thirteen *rhodopus* are extensively red, to and including the under tail coverts; most of them have no streaks, only four showing a few obscure fine shaft lines. By contrast, more than seventy-five per cent of the *sonoriensis* males have no red on the abdomen and under tail coverts and are conspicuously streaked. Van Rossem (Trans. San Diego Soc. Nat. Hist., vol. 6, 1931, p. 295) has called attention to migrant *frontalis* in southern Sonora and has marked four specimens as such in the Dickey Collection, but the elimination of these few birds has little effect on the averages in such a large series. Of the remaining *sonoriensis* only two appear to be unstreaked and only four completely and extensively red, since some with pink under tail coverts have white abdomens and vice versa. By an unfortunate choice, Ridgway selected one of these red, seemingly unstreaked, winter males as the type, whereas his original description clearly depicts a streaked spring bird; but the series available to Ridgway was small. With the present accumulation of a large number of representatives of every form and the new light cast upon the problem by the discovery of the race to the south of the range of *sonoriensis*, Ridgway's treatment of the problem must be reconsidered.

Van Rossem in his report on the collection of land birds from Sonora (*loc. cit.*), Mexico, recognized the race of *sonoriensis* with apparent reluctance. Having no adequate series from Sinaloa available, the conclusion he reached was the logical one at that time. Holding in abeyance for the moment all geographical questions, it is clear that all the characters of *sonoriensis* are strictly intermediate ones between *frontalis* of Arizona and *rhodopnus* of Sinaloa, but the same is true of *ruberrimus* of Lower California, which has no contact with *rhodopnus*. If the ranges of *ruberrimus* and *sonoriensis* were connected at the northern end of the Gulf of California, the two groups would be recognized as identical. Ridgway separates them solely on the basis of measurements and these vary so little in our larger series as to be unimportant. In coloration the breeding birds are indistinguishable and the winter birds are far closer than has previously been suspected. It has been overlooked that some specimens of *ruberrimus* in winter plumage are as extensively red as any *sonoriensis*. A September specimen from Lower California, number 16,963, in the collection of the U. S. National Museum, has extension of red to and including the whole abdomen and under tail coverts. In addition there are three specimens, numbers 13,558, 13,559, and 13,054, in the Dickey Collection, September, October and March birds from Concepcion Bay, Lower California, which also exhibit red on the under tail coverts. The table (p. 205) shows this comparison graphically. It disregards the few specimens in each race that show red on the under tail coverts, but which have whitish abdomens. However, this omission affects the averages but little. The percentages prove that both forms in their winter plumages show a similar tendency toward a more expansively red bird and that, when presence of red on the under tail coverts is considered, *ruberrimus* actually has the largest percentage, 71 as compared with 55. It is noticeable that in neither form is there at hand a single January or February bird showing red on the under tail coverts and only a few in March and April, most of which prove on examination to be late-molted individuals as yet little affected by wear. I have completed the picture by including *frontalis* in the table. In as much as the red does not reach beyond the abdomen in this race, I have based the percentages on the maximum-red specimens, those showing red as far posteriorly as this area. The results are the same as depicted for *ruberrimus* and *sonoriensis* (with respect to red on the under tail coverts) in that they reveal a recession of the red areas, correlated with increase of wear on the feathers. To quote the Micheners (p. 19), "The reds become brighter as the filmy barbules are worn away and the extent of the colored areas decreases as the barbs wear off."

Recession of the red area of the under parts having been proved for the three forms to the north of Sinaloa, *sonoriensis*, *ruberrimus* and *frontalis*, the question arises, why does this process not occur in *rhodopnus*. The answer is found in the individual feather. In *rhodopnus* the abdominal feathers of winter specimens are usually red, almost or entirely, to the gray base of the feather and seldom have shaft-streaks. In *sonoriensis* the feather is red, in most cases, only on a portion of the tip and sides of the feather and there is a subterminal area of white with a heavy brown shaft streak. Heavy wear on the barbs of the *rhodopnus* feather leaves the tip still red, whereas in *sonoriensis* the red is eliminated and the worn tip, which in December was near the middle of the feather, is white with a broad brown streak bisecting it. This white and brown subterminal area, which was concealed in the winter plumage by the tip of the next feather above, is now exposed by the destruction of the latter. In *sonoriensis* the specimens which appear to be so completely red are found to have relatively broad shaft streaks of brown, completely or almost completely concealed by the tips of feathers lying just above. This is true even of the under tail coverts when pink. Wear removes the tips and exposes the streaks. The Micheners noted this in their study of *frontalis*. They remark (p. 14): "These brown feathers are not replacement feathers and are

simply the remains of former red ones" In *rhodopus* there are either no concealed shaft-streaks, or they are so narrow and obscure that this area, exposed in the breeding season, appears red or pink instead of brown.

It is obvious that the few expansively red, winter *sonoriensis* are merely the individual top-waves of an incarnadining tide, which had its inception in *frontalis* in the north and reached its ultimate maximum in *rhodopus* in the south. As the red color spreads down the under parts from chest to tail, it pigments only a narrow subterminal band of the new feathers, which completely wears away in the northern forms. Farther south the pigmentation extends deeper into the feathers, until finally in *rhodopus* wear cannot destroy all the color on the individual feather. Our few extensively red specimens from southern Sonora may now be viewed as merely symptoms of a tendency and serve to confirm the conclusion that southern Sonora is a true intergrading area in this species.

Let us now consider the type of *sonoriensis*. In the first place, it was taken at Alamos in extreme southern Sonora on December 30, during the very period when the greatest extension of red occurs. Nevertheless this bird does not have a red lower abdomen and shows only a moderate amount of pink on the under tail coverts. It does not appear to be heavily streaked, but a lifting of the tips of the various feathers reveals considerable streaking on the abdomen and exceedingly large and wide streaks on the under tail coverts. Had this bird lived until the month of May, its under tail coverts and abdomen would have been white, conspicuously marked by brown streaks. In the second place, size is the most important character in winter plumages, and the type is an extremely large specimen. Among twenty-five males (including all supposed migrants) taken in southern Sonora in winter plumage, only four individuals have a wing measurement of over 76 mm. and only two a tail measurement over 60 mm. Of these the type of *sonoriensis* is the only one which has maximum size in both wing and tail. Considering both measurements, it is therefore the largest of all the twenty-five specimens taken in southern Sonora. In fact, one has to go entirely north of the assumed range of *sonoriensis*, namely to Kino Bay, to find the first specimen, taken at any time of the year, which has both measurements larger, and this specimen has been marked *frontalis* by van Rossem, in which determination I concur. Furthermore, the type is larger than the average of three winter-taken specimens from the northern half of the state and about the average of the six breeding birds from Saric, Sonora, far north near the United States border. The latter point is important, because birds of the breeding season in *sonoriensis*, *ruberrimus* and *rhodopus* have almost identically the same averages as the winter specimens (see table of measurements).

AVERAGE MEASUREMENTS IN MILLIMETERS OF RACES OF *CARPODACUS MEXICANUS*

Male Adults	Wing	Tail	Exposed culmen	Height of bill at base
11 breeding <i>rhodopus</i> , central Sinaloa	71.1	55.23	9.55	7.40
11 winter <i>rhodopus</i> , central Sinaloa	71.2	54.8	9.51	7.43
8 breeding <i>sonoriensis</i> (?), southern Sonora	73.7	56.8	9.99	8.11
19 winter <i>sonoriensis</i> (?), southern Sonora	73.7	57.7	9.90	7.74
type of <i>sonoriensis</i> , winter ♂, B. S. no. 164324	76.1	60.5	10.1	7.6
1 winter <i>frontalis</i> , Kino Bay, northern Sonora	77.4	60.7	9.4	7.9
6 breeding <i>frontalis</i> , Saric, extreme Sonora	77.64	59.2	10.28	8.1
9 breeding <i>ruberrimus</i> , Lower California	72.71	56.94	10.27	8.11
6 winter <i>ruberrimus</i> , Lower California	72.9	56.35	10.3	7.98
18 <i>rhodocolpus</i> (?), Guanajuato, Durango, Jalisco, Colima and Michoacan	80.0	60.6	10.5	8.42
Female Adults				
11 <i>rhodopus</i> , central Sinaloa	68.7	53.0	9.41	7.4
14 <i>sonoriensis</i> (?), southern Sonora	71.9	55.8	10.07	7.80
3 <i>ruberrimus</i> , Lower California	69.6	53.5	10.15	8.1

On the basis solely of the critical characters of size and concealed streaking, the type would be considered a migrant *frontalis* from the northern part of Sonora, along with three other specimens of slightly smaller size which are marked *frontalis* in the Dickey Collection. To sum this up, in view (1) of identity with specimens of *ruberrimus* in color, (2) identity with *frontalis* of northern Sonora in size, and (3) the fact that the bird was taken in December when the expansion of red reaches its maximum, it would seem wise to consider this type an expansively red migrant *frontalis* from northern Sonora.

This leaves the bird of southern Sonora without a name. I can perceive no advantage in coining one. The critical birds in the *mexicanus* group for taxonomic purposes are the breeding birds and the long series from southern Sonora are not only not distinguishable from breeding *ruberrimus* in size or color, but are exactly intermediate between *frontalis* of northern Sonora and *rhodopneus* of Sinaloa. On the other hand, in view of the present isolation of *ruberrimus* in Lower California, I can raise no objection to recognizing that race, nor would I protest the use of the name *ruberrimus* for the birds of southern Sonora, if anyone desires a handle for these intergrades. Certainly there are many true intergrades in other species, whose subspecific names are still recognized. If this is deemed an illogical suggestion, it may not be impertinent to ask if Nature herself was illogical in creating two similar forms under nearly parallel conditions, one of them an intergrade and the other a true race.

California Institute of Technology, Pasadena, California, June 18, 1936.

EAGLE "CONTROL" IN NORTHERN CALIFORNIA

By FREDERICK H. DALE

The use of the airplane in hunting predators, affording as it does a highly efficient means for destroying large birds, particularly eagles, should arouse the keen interest of all conservationists. Between February 1 and March 31 of this year, I had the opportunity of studying first-hand the conditions under which this type of hunting was being carried on in the country east of Red Bluff, Tehama County, California. It was apparent that several important phases of this rigorous campaign of predator control were being overlooked by the persons engaged in the activity.

During the period mentioned I did not have the privilege of observing the actual killing of an eagle, but I did see five eagles that local herders stated had been killed or crippled from an airplane, and I saw the airplane hunting for the birds on one occasion. The facts reported here have been gleaned from newspaper accounts and from interviews with two persons who have actually taken part in the hunting, as well as from interviews with other persons connected in some way with sheep raising in the Sacramento Valley.

The method used in hunting eagles is related by Mr. Ben Torrey of Corning, California, in a letter published in the sporting page of the San Francisco Chronicle. This evidently was written for the purpose of interesting hunters in this new sport. In his letter Torrey says, "I use my airplane, which is a three-place biplane. I removed the left door so the gunner can shoot out to the left. I have ribbons taped on the wires so they will not shoot into the propeller. The ribbons are simply indicators so as not to get [the] muzzle in that area. I recommend a shot gun with about No. 2 shot. At times I am able to fly within 50 feet of the bird by getting behind and slightly over it. We are permitted to kill golden eagles, but not the bald variety"

"This is something new and I am in the business of taking passenger-hunters out. In an hour's time I usually cover over 70 or 80 miles of territory"

In the same article in which the above letter is quoted there is mention of a former article concerning the skill of one "Lefty" O'Doul in shooting eagles from an airplane "in the upper California country."

A few days later, April 8, 1936, an article appeared in the Red Bluff Daily News, from which the following is quoted: "When friends of Floyd Nolta, Willows flier, heard today that Ben Torrey, the Corning aerial wild game hunter, had killed 38 eagles by plane, they said that was pretty good but that Nolta had killed 160 . . ."

From information contained in this latter item, and from the statements of persons engaged in eagle hunting, it is evident that the total number killed during the past winter and spring was over 200. I was told by a reliable person that 13 eagles were killed in one day by hunters from an airplane. I saw this airplane hunting for eagles east of Red Bluff on that day, but did not learn the extent of the area covered in the day's hunting.

Although the Golden Eagle, *Aquila chrysaetos*, is a permanent resident of the Sacramento Valley, the Bald Eagle, *Haliaeetus leucocephalus*, which migrates into that region in winter, is more abundant during that season than the Golden Eagle, at least in the country east of Red Bluff. The five eagles seen by me, and said to have been killed or crippled from an airplane, were all Bald Eagles. If the same conditions with regard to the relative abundance of these two birds exists over the whole Sacramento Valley, it is probable that the greater part of the birds killed were Bald Eagles.

One sheepman explained his stand against eagles as follows: "We have lost lambs from our corral. We feel certain that they were taken by eagles. We do not know what eagles killed them, so we kill all the eagles we can." There is the general belief that all eagles must be alike in habits, and since the Golden Eagle is known to kill lambs, it is assumed that the Bald Eagle has similar habits. Another thing held against the Bald Eagle is the fact that these birds migrate into sheep country shortly before the lambing period.

I was not successful in learning what loss the sheepmen estimated had been suffered from the eagles. One man saw a Golden Eagle strike into a band of lambs and wound five of them so badly that they died. The eagle was killed, and I later saw it as a mounted specimen. This was the only definite account I was able to unearth, although I questioned a great many persons on the subject. This same man stated that he believed the loss from eagles would be greater than the seven hundred dollars which was said to have been paid by his employer in the form of eagle bounties during the past winter and spring. In order for this belief to be correct it would be necessary for eagles to kill many more lambs than the evidence I have been able to collect would indicate. In spite of the large number of Bald Eagles in the area about Red Bluff, and although eagles do their hunting in broad daylight, I was not able to find anyone who had ever seen or heard of a Bald Eagle attempting to kill a lamb. Since the Golden Eagle is relatively uncommon in that area, it is not likely that the loss of lambs from this source would be extremely high.

In considering the economic status of eagles, the two kinds must be given separate treatment because of wide differences in habits. Several accounts of food-habits are available for both birds, and it is one purpose of this report to sum up the results of the most important of these in an attempt to interpret the status of both eagles in relation to the agriculturalist.

The Golden Eagle is recognized generally as having more predatory habits than the Bald Eagle, and investigations have largely substantiated this opinion. Stomach content analyses and studies about the nests of the Golden Eagle have indicated that this bird is primarily a hunter of live game, although it may on occasion stoop to scavenger habits. McAtee (U. S. Dept. Agr., Circ. No. 371, 1935, p. 24) found rabbits

to be the chief food of the Golden Eagle, as indicated by analyses of 26 stomachs, evidently taken from scattered localities. In his analysis, rabbits made up more than 50 per cent of the food, being found in 14 of the 26 stomachs examined. No other item was significantly abundant, carrion rating second with 3 occurrences, or about 12 per cent.

Oberholser (U. S. Dept. Agr., Biol. Surv. Bull. No. 27, 1906) shows that ground squirrels (*Citellus beecheyi*) are important items of food for Golden Eagles. He cites W. L. Finley's report upon a pair of nesting Golden Eagles near Oakland, California, in which Finley estimated that a single pair of birds would kill approximately 540 ground squirrels during the three months in which they had young in the nest. Oberholser also makes a general statement to the effect that Golden Eagles do much damage at times on sheep ranges, but does not cite definite instances or estimate the amount of damage a Golden Eagle might do.

Sumner (Auk., vol. 46, 1929, pp. 161-169) found that ground squirrels were the most important item of food brought to the nest by a pair of Golden Eagles in southern California. Ground squirrels were found in the nest whenever he visited it during the nest life of the young eagles. Grinnell and Dixon (Bull. State Comm. Hort., vol. 7, 1918, p. 622) cite an instance in which eleven freshly killed ground squirrels were found in and about an eagle's nest that contained two eaglets about a week old.

The benefits to the stock raiser derived from the activities of a pair of Golden Eagles operating on his range can be realized when the destructive nature of rabbits and ground squirrels is taken into consideration. In normal numbers these pests may be of minor importance, but with their natural checks removed they can, and often do, become problems of major significance to all phases of agriculture as well as to public health. Many of the natural enemies of these pests have been detrimental in some way to one or another interest and have been reduced in numbers until they no longer play any important part in the natural control of rodents and rabbits. It is unfortunately true that any predatory animal large enough to prey upon rabbits and ground squirrels may at some time be detrimental to human interests. However, to condemn a species because of occasional damage when the greater part of its activities is beneficial is as logical as condemnation of the rain because it may bring the flood. It would seem no more than just, therefore, to limit killing of eagles to those individuals known to be destructive. Persons engaged in branches of agriculture in which the ground squirrels or rabbits are serious pests should be entitled to consideration before large numbers of these controlling predators are slaughtered.

When the Bald Eagle is considered, an entirely different problem presents itself, for here we have a bird known almost universally as an eater of fish and carrion. McAtee (*loc. cit.*) found the carrion eating tendency so marked as to cause him to say that "... question arises in the case of almost everything found in the stomach of this bird as to whether it may not have been taken as carrion." His conclusion after analysis of 58 stomachs of the Bald Eagle is that the bird is "a vulture in the guise of a hawk." The strange condition arises, then, in the eagle slaughter, that the bird shown by food habits studies to be the least predatory of all the hawks, the bird selected as the national emblem of our country, is the chief victim.

To sum up the salient facts of the situation, Golden Eagles are highly beneficial to agriculture in the sum-total of their activities and should not be destroyed as a species, although occasional individuals may require destruction because of lamb-killing habits. Control should be limited to the areas where these birds are known to be killing lambs. Bald Eagles have not been found guilty as yet of killing lambs and their slaughter represents a poor investment by the sheep-owner.

Red Bluff, California, June 12, 1936.

A NEW FOSSIL BIRD LOCALITY NEAR PLAYA DEL REY, CALIFORNIA,
WITH DESCRIPTION OF A NEW SPECIES OF SULID

WITH ONE ILLUSTRATION

By HILDEGARDE HOWARD

A new fossil bird locality has recently come to light as a result of excavations in a marine deposit rich in molluscan remains. This deposit occurs on Lincoln Boulevard, in the Del Rey Hills, about two miles east northeast of Playa del Rey, Los Angeles County, California. The fossil-bearing stratum is about one foot in thickness and lies three feet below the present surface and fifty feet above sea level. For the discovery of this new locality, and for most of the bird specimens available, I am indebted to Mr. George Willett of the Los Angeles Museum. With the thirty thousand or more shells of molluscs from this deposit which he has identified and added to the museum collections, he has brought in twenty bones of birds. To these have been added thirteen others, contributed by interested friends who have collected on a smaller scale in the same locality. I take this opportunity to express my thanks to these collectors who have thus helped to make this study complete: Mr. Harry Fletcher, Mrs. Bertha Fuller, Mr. J. C. Marsh, Mr. Henry Matthews and other students of Glendale Junior College, and Messrs. H. C. and Homer L. White.

According to Mr. Willett's study (MS) of the molluscs, which reveals that many of the species are not now known to occur as far north as this latitude, it is assumed that the temperature of the water was slightly warmer at the time the deposits were laid down than it is today. This is in keeping with previous ideas regarding the Upper San Pedro Pleistocene, to which age Mr. Willett assigns the Del Rey beds. The molluscan species further indicate that the deposit was laid down under ten to fifteen fathoms of ocean water. In this latter point, the Del Rey deposit differs from the "Lumber Yard" locality of the Upper San Pedro, at San Pedro, California, from which Loye Miller (Univ. Calif. Publ. Geol., vol. 8, 1914, pp. 31-38) has recorded avian remains. At this latter site, the deposit indicated a beach accumulation in which marine forms were associated with large Pleistocene land mammals. At Del Rey, none of the Pleistocene land mammals is represented, the identifiable mammal bones including only cetacean, seal and pocket gopher. It is possible that the latter was a later introduction, since gophers are plentiful in the locality today.

All of the identified birds are such as may be associated with a marine environment. Twenty-one of the thirty-three avian specimens examined are identifiable. These fall into ten species, of which eight are similar to forms now living on the coast, one has been previously recorded only from the Pleistocene, and one is a species new to science. An account of the known forms follows.

Gavia, near *immer*. Loon. Proximal and distal ends of tarsometatarsus, undoubtedly of one bone, are assignable to the genus *Gavia*, but they are so badly worn as to make unwise a definite species identification. Though the size is close to *Gavia immer*, and larger than either *pacifica* or *stellata*, certain characters of the hypotarsal region suggest *stellata*. In *immer*, and to a less extent in *pacifica* as well, the hypotarsus is set in from the external edge of the shaft, and the space between, in which lies the foramen, is deeply grooved. In *stellata*, this groove is shallow, and hypotarsus, foramen and external edge of shaft are nearly on a level. In this area in the fossil, the deep grooving of *immer* is not apparent. This may, however, be due to the way in which the bone is worn.

All three species of loon are common winter visitants along the coast today. Miller (*op. cit.*, pp. 33-34) reports two bones from the Upper San Pedro Pleistocene beds at San Pedro, one of which he finds close to *immer*.

Aechmophorus occidentalis. Western Grebe. A fragment of sternum and two incomplete femora

are assigned to the Western Grebe, common here today. The sternum is distinguishable from *Colymbus holboellii* on the basis of the curvature of the anterior edge, which is narrower and deeper in *Ae. occidentalis* and the fossil than in the Holboell Grebe. The femora, though slightly larger than available specimens of modern grebe, resemble the Western Grebe in (1) presence of well-marked depression at proximal end of rotular groove, and (2) position of tubercle on posterior side of distal end (nearer internal margin of bone than in *C. holboellii*). *Aechmophorus occidentalis* has been recorded from three other fossil deposits in California: the Upper San Pedro Pleistocene of San Pedro, the Manix (lower Pleistocene?) beds of the Mohave Desert, and the Rodeo Pleistocene of the San Francisco Bay region. The genus is well represented also in the Fossil Lake Pleistocene deposits in Oregon, where in addition to *Ae. occidentalis*, an extinct species, *Ae. lucasi* has been recorded (Miller, Univ. Calif. Publ. Geol., vol. 6, 1911, p. 83). Though, as stated above, the Del Rey femora are large, they do not exhibit the relative stoutness of shaft cited as diagnostic of *Ae. lucasi*.

Diomedea albatrus. Short-tailed Albatross. An incomplete carpometacarpus is assigned to the Short-tailed Albatross, and distinguished from the Black-footed, on the basis of greater breadth of the shaft of metacarpal 2. A complete radius, 292 mm. in length, is also tentatively referred to this species. It is too large for *nigripes* and agrees in breadth with specimens from an Indian shellmound at Point Mugu, California, which are thought to belong to *albatrus*. The Short-tailed Albatross occurred along our coast in some numbers at least up to the latter part of the nineteenth century, but is now rare or extinct. Judging from diagnostic elements present in the Point Mugu shellmound material, it was a common form inshore a century ago. In fact, in these kitchen middens only one out of the seventy-four albatross bones recovered was definitely assignable to *nigripes*, while fifty-five undoubtedly belonged to *albatrus*.

Miller (Univ. Calif. Publ. Geol., vol. 8, 1914, p. 34, and Condor, vol. 32, 1930, p. 117) gives two records of *Diomedea* from the Pleistocene at San Pedro, one slightly larger than *nigripes* and one nearly as large as *exulans*.

Puffinus griseus. Sooty Shearwater. A complete radius is similar in all characters to modern specimens of Sooty Shearwater and cannot be confused with the longer, more slender bone in *P. creatopus*. *P. griseus* is abundant along our coast today and the species is represented in the San Pedro Pleistocene avifauna as well.

Puffinus opisthomelas. Black-vented Shearwater. An incomplete femur, lacking the distal end, agrees with the Black-vented Shearwater in size and in characters of proximal end which distinguish it from *P. creatopus*, *tenuirostris*, and *griseus*: (1) trochanteric crest less developed; (2) small depression present below proximal end near head, on anterior face. Another proximal end of a femur resembles *opisthomelas* in the latter characters but is larger (8.1 mm. across proximal end) than the largest available specimen of *opisthomelas* (7.6 mm.). Like *Puffinus griseus* this species is common off the coast today, and has been recorded from the Pleistocene of San Pedro.

Chendytes lawi. Three specimens of femur, a tibiotarsus and tarsometatarsus conform with figured specimens (Miller, Condor, vol. 27, 1925, p. 146, fig. 40, and vol. 37, 1930, p. 118, fig. 45) of this extinct species of diving "goose." Comparisons have been made, also, with specimens at the University of California at Los Angeles assigned by Dr. Miller to this species. A phalanx resembling one of *Mergus americanus*, though very much larger, is in all probability assignable to *Chendytes* also. A badly worn distal end of a tibiotarsus may be of this species but appears to have a rounder, more slender shaft as in the true geese. The Del Rey locality affords the fourth locality record for *Chendytes*, the others being the Upper San Pedro Pleistocene of Santa Monica and San Pedro, and the Lower San Pedro Pleistocene of Sexton Canyon, Ventura County, California. At the Del Rey site, it is the most abundantly represented of all the avian species found.

Duck, sp. A distal end of a humerus resembles *Spatula clypeata* and *Chaulelasmus streperus*. I am unable to distinguish these two forms from the characters of this portion of the humerus.

Uria aalge. Murre. A distal end of an ulna, though somewhat worn, is very similar to modern specimens of the California Murre. It is larger than that of the Rhinoceros Auklet and differs from both *Cerorhinca* and *Puffinus* in the longer, less abrupt carpal tuberosity. This is the first record of this species as a fossil. Though it is seen occasionally off our coast today, it is not abundant.

Corvus corax. Raven. A complete femur represents an immature raven. The raven is well represented in Pleistocene deposits in California, though it has not been recorded from those at San Pedro. Young ravens, with bones in about the same stage of ossification as the one from Del Rey, are abundant in Indian kitchen middens on Santa Cruz Island.

In addition to the specimens assigned to the known species discussed above, there is a left coracoid, complete except for the external portion of the sternal end, which represents a large sulid. A study of twenty-nine modern sulid bones, representing four

species of *Sula* and three of *Moris*, reveals diagnostic features separating these two genera. In each generic character the fossil coracoid agrees with *Moris*. For the opportunity to study this modern material, I am indebted to Dr. J. Grinnell and the Museum of Vertebrate Zoology, Berkeley; Dr. A. Wetmore and the United States National Museum; and Dr. Loye Miller.

The outstanding generic characters noted are as follows: (1) as cited by Wetmore (Auk, vol. 43, 1926, p. 466), "In the coracoid the lower anterior face is broad and plane toward the inner side in *Moris*, while it is narrower and more rounded in *Sula*"; (2) the ventral portion of the sternal facet is relatively longer and narrower in *Moris* than in *Sula* and lacks the noticeable groove which characterizes the latter; (3) relative to the length of the entire bone, the portion from the procoracoid to the head is both broader and longer in *Moris* than in *Sula* (average ratios for *Moris*, breadth of head 26.7 per cent, breadth at scapular facet 30.8 per cent, length of dorsal portion, 42.9 per cent [average for *Sula* for the same ratios, 22.9, 26.1 and 38.6]); (4) at the head end, the bicipital attachment is more faintly marked in *Moris* than in *Sula*, being in the form of a deep pit in the latter.

In specific characters, the fossil bears resemblance to several modern forms, though the combination of characters is unlike any one. It is therefore here described as new.



Fig. 37. Coracoid of *Moris reyana*, Los Angeles Mus. no. 991. Type specimen, natural size; a, anterior view; b, internal view.

Moris reyana, new species

Type.—Left coracoid, Los Angeles Museum, number 991, from Lincoln Boulevard, Del Rey Hills, 2 miles east-northeast of Playa del Rey, California; collected by George Willett, March, 1936. Upper San Pedro Pleistocene. (See fig. 37.)

Description.—(1) In general similar to *Moris bassana*, but 10 per cent smaller; size closer to *M. serrator* or *M. capensis*. (2) Head with line from brachial tuberosity running obliquely upward, but not cutting across to join clavicular facet; in this character the resemblance is closer to *Sula l. brewsteri* than to any other sulid. (3) Head protruding slightly beyond adjacent surface, though joining smoothly with this surface; lacking abrupt overhang found in *S. l. brewsteri*; closest to *M. bassana*. (4) Surface adjacent to head smooth and flat as in *M. capensis*.

Measurements of *Moris reyana*

(a) Length from head to internal point of sternal edge	56.6 mm.
(b) Breadth of head	15.5
(c) Breadth at level of scapular facet	17.1
(d) Distance from procoracoid to head, measured from beneath scapular facet to tip of head	24.7
Ratio of (b) to (a)	27.4 per cent
Ratio of (c) to (a)	30.2
Ratio of (d) to (a)	43.6

Referred material.—A pedal phalanx, L. A. Mus. number 996, appears to belong to a large sulid, thus probably *Moris reyana*.

The occurrence of *Moris reyana* in the Pleistocene of California points to the comparatively recent (geologically speaking) disappearance of the gannets from the Pacific coast. The genus was evidently widespread in the Miocene, being known from Mary-

land and New Jersey (*Moris loxostyla*) and also from California (*Moris vagabundus*). Though the coracoid of *M. vagabundus* is not known, if its proportions can be calculated to be similar to others of the genus, its small humerus indicates a bird smaller even than *M. loxostyla*. The latter, judging from the figured photograph (*M. [atlantica] loxostyla*, Shufeldt, Trans. Conn. Acad. Arts and Sci., vol. 19, 1915, pl. xv, fig. 123) is about the size of *Sula l. brewsteri*, and thus some nine per cent smaller than *M. reyna*.

Among the sulids from the Lompoc Miocene, *Sula lompocana* was originally described as similar to *Moris* (then *Sula*) *bassana* (Miller, Carnegie Inst. Wash. Publ. 349, 1925, p. 114). In connection with the present study, I have examined a specimen of this species (not the type) in the collections of the University of California at Los Angeles (figured by Miller, *op. cit.*, pl. 9) as well as a cast of the type itself. These specimens show the coracoid of this species to have the long, narrow sternal facet, the broad area toward the inner side of the lower anterior face, and the relatively long dorsal end characteristic of the gannets. The species would, therefore, be more properly assigned to *Moris*, now that this genus is distinguished from *Sula*. In size, the coracoid of *lompocana* agrees with *M. bassana* and is larger than the Pleistocene *M. reyna*, just described.

SUMMARY

In the foregoing paragraphs the following facts have been presented:

- (1) A new Pleistocene fossil bird locality has been recorded from the Del Rey Hills, California.
- (2) Eight of the ten species of birds represented are similar to forms living along the coast today.
- (3) This deposit is the fourth locality to yield specimens of the extinct diving "goose," *Chendytes lawi*.
- (4) A new species of gannet, *Moris reyna*, is described.

Los Angeles Museum, Los Angeles, California, June 1, 1936.

FROM FIELD AND STUDY

Community Nesting of Western Robins and House Finches.—Two instances of Western Robins (*Turdus migratorius propinquus*) and House Finches (*Carpodacus mexicanus frontalis*) using the same nests have come to our attention during the past three years. In May, 1934, we were informed that House Finches were feeding young robins in a nest on a front porch in east Denver, Colorado. On investigation we found four half-grown robins, two newly hatched finches and four finch eggs. There were two female finches apparently with the same mate, and the three finches and the two adult robins fed the young regularly. Unfortunately, however, the large robins smothered their small nest mates. We did not determine whether the four remaining eggs hatched. All three adult House Finches fed the young robins in the nest, and after the young had left the nest.

On May 15, 1936, in a similar instance, the nest was on the back porch of Bailey's home, 2540 Colorado Blvd., Denver. The young robins were nearly ready to leave the nest, and there was no evidence that the pair of House Finches had laid eggs. However, both adult finches and robins fed the young regularly. The male finch was particularly solicitous and would alight on a wire a few feet from the nest and sing whenever one of the other birds brought food. The young robins left the nest May 20, and the finches were the only ones noted feeding them from that time on, although the adult robins were about and no doubt shared the responsibility.—ALFRED M. BAILEY and ROBERT J. NIEDRACH, *Colorado Museum of Natural History*, Denver, June 15, 1936.

82/ **The Mockingbird in North Dakota.**—In the recent article on northern records for the Mockingbird (*Mimus polyglottos*) by L. B. Potter (Condor, vol. 38, 1936, p. 86) no mention is made of my record (Univ. Mich., Mus. Zool., Misc. Publ. No. 10, 1923, p. 77) of a bird taken on the campus of the University of North Dakota on November 23, 1916, by C. C. Schmidt.

In view of the records given by Mr. Potter to the north of the United States boundary, this species must migrate up the Mississippi Valley. There are several records for Minnesota. My experience with the species in Michigan shows the same remarkable northward extension of range. It was first recorded for the state in 1837, by Dr. Sager, and it has been included in lists by most ornithological writers since that time. In over sixty years of bird study in Michigan, my first sight of this bird was on September 26, 1929, on Isle Royale, when an immature one came in a wave of migrating thrushes from the Canadian shore. The first record of this species from the Upper Peninsula, a bird seen from October 5 to 9, 1925, was given by Professor John N. Lowe (*Auk*, vol. 43, 1926, pp. 248-249). Mr. Oscar M. Bryens, of McMillan, Luce County, saw one there on June 19, 1929.

While this bird has been a more or less rare one in southern Michigan since early history, it is only in recent years that it has extended its range so far to the north.—NORMAN A. WOOD, *Emeritus Curator of Birds, Museum of Zoology, University of Michigan, Ann Arbor, March 25, 1936.*

"Ft. Lowell, Arizona."—The vertebrate zoologist who sees that inscription upon a specimen label or in some published record cannot but get a thrill from it. Bendire made ornithological history there in Apache days. Mearns followed him closely. Through the doorway at the extreme right of the



Fig. 38. The Post Trader's building at old Fort Lowell, Arizona, in 1935.

accompanying picture (fig. 38), heavy game bags were carried by W. W. (Billy) Price, Ben Condit, Ray Lyman Wilbur, Loye Miller, Malcom Anderson, and Will Dunn. That was more than forty years ago. This photograph, taken in 1935, shows the building very much as it looked to those young enthusiasts. The building was put up by the post trader during military occupation. The fort proper was some fifty yards to the right—a great quadrangle of adobe construction already in almost complete ruin in 1894.—LOYE MILLER, *University of California, Los Angeles, June 17, 1936.*

Status of the Marbled Godwit in Arizona.—In a recent issue of the *Condor* (vol. 38, 1936, p. 120), Mr. Lyndon L. Hargrave established the Marbled Godwit (*Limosa fedoa*) as a bird of Arizona on the basis of a specimen in this museum, and he referred in a general way to other observations.

The fact is that this species is a fairly common migrant on Mormon Lake, some 30 miles south of Flagstaff. It was noted daily by me, September 3 to 13, 1933, when 19 individuals were counted. On May 6, 1934, a flock of about 30 mixed willets (*Catoptrophorus semipalmatus*) and godwits was seen in the gathering dusk, and several godwits were definitely identified by sight and call. Next day some 24 willets were scattered about the lake, but only one godwit was found (and collected). On August 31, 1934, I again visited this lake, with Mr. H. N. Russell, Jr., and a flock of 9 godwits was seen. The only other trip I have made to this lake was August 4 and 5, 1933, when we camped overnight, leaving early in the morning.

Away from Mormon Lake, the only record is of a single bird seen by Hargrave at a temporary tank about 35 miles east-southeast of Flagstaff (Upper Sonoran grassland) on August 20, 1933.

While it is perhaps dangerous to generalize from a single locality, it seems likely that the Marbled Godwit is a not uncommon transient in the San Francisco Mountain region, determined dates being May 6 and 7 and August 20 to September 13.—ALLAN R. PHILLIPS, *Museum of Northern Arizona, Flagstaff, April 8, 1936.*

Occurrence of the California Clapper Rail away from Marshes.—The California Clapper Rail (*Rallus obsoletus obsoletus*) is an inhabitant of the salt-water marshes around San Francisco Bay. Information concerning its distribution shows a remarkable restriction to this habitat which not only is small, but which now is being invaded rapidly by development of this area for human use. Any clues as to what may become of the rails when the marshes are drained should have significance for the future welfare of the species.

I am acquainted with two occurrences of rails which bear upon this situation. On the morning of September 3, 1928, at the corner of Hearst and Walnut streets in Berkeley, I picked up a dead rail at the south base of a woven wire fence which surrounds a plot of ground used for experimental purposes by the College of Agriculture of the University of California. The bird's bill was broken and bent, and it obviously had been killed by striking the fence. It was a male, weight 330 grams, and is now skin number 53226 in the Museum of Vertebrate Zoology. The second specimen was brought to the Museum by Mr. Gordon Bolander who found it on October 4, 1932, "dead beneath a barbed wire fence" at the corner of 14th Avenue and East 14th Street, Oakland. This one also was a male; it is skin number 62350.

Both these birds evidently were flying low, over dry land, and at a distance from the water. The first one was at least two miles from the nearest point on the Bay and considerably farther from the nearest suitable habitat for rails. These examples give basis for the suggestion that the birds move about by lengthy flights, at least in the fall, and further that so long as there is marshland available in the region the species may be expected to occupy it, if not already fully populated, by moving in from reclaimed areas when these are being drained.—JEAN M. LINSDALE, *Museum of Vertebrate Zoology, Berkeley, California, February 15, 1936.*

Unusual Nesting Site of the Eastern Kingbird.—The weather records of eastern Montana, in common with those of most of the Great Plains, have shown unusually low rainfall during the

past decade; and the series of dry years culminated in the great drought of 1934. May we conclude, then, that it was with a humorously shrewd eye to safety that a pair of Eastern Kingbirds, *Tyrannus tyrannus*, the following year selected a rain gauge for a nest? (See fig. 39.)

The gauge was kept by the Forest Service at Hogback Well, Fort Keogh, near Miles City, Montana. The writer noticed shreds of grass and soft sagebrush bark in the inner container on June 20 or 21, 1935. It seemed odd at the time; but he did not see the birds bringing nesting material and connect cause with effect until the 23rd. Another gauge was set up promptly so that records could be made without disturbing the birds. By the morning of July 1 the nest had been lined with horsehair and there were two eggs in it. By evening there were three. Next day a fourth egg was laid.

The question in all observers' minds was whether the bird would sit and the eggs could remain viable in that metallic depression under the terrific heat of midsummer. However, tragedy ended the speculation. In the evening of July 3 a rainstorm was in progress. Mr. F. M. Benson, who was living in the Hogback cabin at the time, reports that the bird sat during all the rain. But when hailstones as much as one-half inch in diameter began to fall, so heavily that they made the ground almost completely white, the bird had to desert the nest, and the eggs were smashed. Neither of the pair was seen in the vicinity afterward.—LINCOLN ELLISON, *Miles City, Montana, April 21, 1936.*



Fig. 39. A pair of Eastern Kingbirds selected a rain gauge for a nest site; near Miles city, Montana, July 2, 1935.

A United States Record of the Pacific Golden Plover.—The Dickey collection at the California Institute of Technology contains a specimen (no. 21286) of *Pluvialis dominica fulva*, which was collected at Clallam Bay, Clallam County, Washington, on October 28, 1921, by Carl Lien. The original source of this specimen was the D. E. Brown collection, which was purchased by Mr. Dickey in 1927. It may be added that Major Allan Brooks has recently examined the bird (a male of the year) and has verified my own identification.—A. J. VAN ROSSEM, *San Diego Society of Natural History, Balboa Park, San Diego, California, March 29, 1936.*

What is the Status of the Inland Crested Cormorant of California?—The recent article concerning the cormorants of Great Salt Lake, Utah, by Mr. William Behle (Condor, vol. 38, 1936, pp. 76-79) was of more than casual interest to the present writer since it brought vividly to mind the conditions which existed at Buena Vista Lake in Kern County, California, in the summers of 1922 and 1923. When I made observations at the lake in late June and July, 1922, the scores of adult cormorants then present had long since dropped their nuptial plumes. The single adult collected at that time (July 1) retained three short plumes worn down to but a fraction of their original length. These remaining stubs were black. A juvenile (July 26) is darker below than five *albociliatus* from the seacoast of southern California and is similar in this respect to five juveniles of *auritus* from the Atlantic coast. However, the relatively few specimens examined in this last connection make me hesitant about suggesting this feature as a racial character.

In April and early May, 1923, I again visited the lake, in company with Major Allan Brooks, and at this time the vast majority of the adult cormorants bore nuptial plumes. So far as we could determine by visual means—and we observed a great many birds at very close range—the plumes varied from pure black to pure white, although most individuals showed a mixture. The four specimens collected in 1923 are characterized as follows: adult female (April 27) with plumes entirely black save for a few minute white streaks behind the eyes; adult female (April 27) whose plumes were mixed in the proportion of two white to one black; one-year-old female (April 27) with plumes about equally black and white; adult female (May 6) whose plumes were entirely white.

Summarizing the above evidence and basing subspecific determination only on the color of the nuptial plumes, it would appear that the cormorants of Buena Vista Lake are intermediate in characters between *Phalacrocorax auritus auritus* and *Phalacrocorax auritus albociliatus*, with certain individuals showing the extreme characters of either race, and that the mass average is slightly in favor of the white-plumed *albociliatus* type. Whether this average would be maintained were an adequate series of specimens collected is, of course, problematical.—A. J. VAN ROSSEM, *San Diego Society of Natural History, San Diego, California, May 12, 1936.*

Two New Records for Zion National Park, Utah.—In checking over a card index of the avifauna of the Zion Canyon region, Utah, I find the following unpublished records.

Long-tailed Chickadee (*Parus atricapillus septentrionalis*). On February 9, 1936, Mr. W. S. Long observed one on the Narrows Trail, at the head of Zion Canyon. Mr. Long is familiar with this species, and was able to observe this individual for five minutes at a distance of thirty feet.

Black Rosy Finch (*Leucosticte atrata*). On February 3, 1936, Mr. Long, at that time Wildlife Technician in the park, collected an adult male from a large flock near the Mount Carmel Highway, 5500 feet altitude, a few miles east of Zion Canyon. The specimen is now in the Zion Museum, number 125.—C. C. PRESNALL, *Zion National Park, Utah, April 4, 1936.*

Observations on the Food of the Duck Hawk.—Twenty-six pellets were taken from under the regular winter roost, near Santa Barbara, California, of an adult female Duck Hawk (*Falco peregrinus anatum*). The roost was on an old wooden tower on the beach, near a small slough which is frequented by ducks and other water birds. The pellets were taken in March, and showed the following contents. (Numbers are of pellets and not of individuals represented.)

5 grebes, probably all the Eared Grebe (*Colymbus nigricollis californicus*)

8 almost certainly same as above

11 American Coots (*Fulica americana americana*)

1 yellow-legs (?) (*Totanus*, sp.)

1 rabbit (*Sylvilagus bachmani*)

Partly eaten birds found under the roost were two Eared Grebes and a Killdeer (*Oxyechus vociferus vociferus*). Since a Duck Hawk will rarely strike a bird except on the wing, the large number of grebes is remarkable. The same Duck Hawk was seen to kill a Ruddy Duck (*Erismatura jamaicensis rubida*) earlier in the year.

An immature male Duck Hawk spent from early November to near the end of February at another slough near Santa Barbara, in which water fowl are protected and fed. The attendant saw

the hawk with prey, or making a kill, on about two or three days out of each week. Its prey was in every case a coot. It was seen one day stooping at the head of a domestic (Chinese) goose, but it did not actually strike the bird.—RICHARD M. BOND, *Oakland, California, December 3, 1935.*

Records of Two Species New to Arizona.—In the course of making a more detailed examination of certain species in the Thayer collection than was possible when it was first presented to the Museum of Comparative Zoology by the late Colonel John E. Thayer in the autumn of 1931, I find two Arizona records that seem to be worthy of note.

Dryobates nuttallii. An adult female in rather worn plumage was collected by G. F. Breninger at Phoenix. On the original label the month has been blotted and it is not certain whether "Jan." or June is intended, but from the worn condition of the plumage I judge it to be a summer bird. If this assumption is correct then the date of collection is June 24, 1901.

Tyrannus melancholicus occidentalis. A female taken by H. H. Kimball at Fort Lowell, May 12, 1905. This specimen is very obviously not a Couch Kingbird, *T. m. couchii*, but agrees in smaller size and in other details with a series of the race *occidentalis* from western Mexico (Sinaloa to Guerrero).—JAMES L. PETERS, *Museum of Comparative Zoology, Cambridge, Massachusetts, June 1, 1936.*

Tribulations of Thorn-dwellers.—To explore a Cactus Wren's nest in a cholla bush seldom fails to engender speculation on the ways and means by which the birds safely build and use the structure. Such meditation associated with the prick of cactus spines does not lead to any simple answer. Surprisingly little is known about the foot-work of thorn-frequenting species that might be vital to their successful negotiation of these hazards. A part of the problem is the frequency with which animals become entangled in thorns. Is the hazard one easily surmounted or does it require constant vigilance and special dexterity? Any harmful agency such as thorns will rarely be seen in operation, for, barring mass destruction, loss to a species of bird can not ordinarily be sustained at a high rate.

During a month's field work in the Arizona desert I felt especially fortunate in four times seeing interference with the routine activity of animals by thorns or spines. A certain unworthy satisfaction also was felt that I was not the only animal being caught by these prominent features of the xerophytic flora.

One morning, the 13th of May, 1936, on Rillito Creek at Fort Lowell, Arizona, I stopped close to the nest of a Verdin (*Auriparus flaviceps*) situated in a mesquite bush. Although I neither touched the nest nor shook the tree, an adult bird, surprised at my presence, attempted to leave the nest. At the entrance it became entangled in the canopy of thorny twigs. One wing was hooked in the tangle, some of the primaries protruding outward. The bird fluttered, but made no progress in freeing itself. I moved toward it and slowly reached out, touching its wing. At that moment a final effort freed it from the twigs, but its position for some time had been extremely hazardous. Was the bird so much hurried in its departure that it failed in some detail of its customary action?

The next day, along the Rillito, a nest of a Palmer Thrasher (*Toxostoma curvirostre palmeri*) was found in a large cholla. The three young were mature enough to take notice of my approach fifteen feet away and to start moving out of the nest. Under no special coercion, they tried to run along the cholla limbs. Most young passerines at this age, though awkward, would have progressed satisfactorily through the twigs of a bush. The thrashers had evident trouble with the thorns. Many times their feet were caught, throwing their bodies forward onto the thorns. There must be some particular way of placing the feet to avoid the spines. One of the young continued on until it became badly entangled with a burr on the side of the body that would seem certain to have resulted fatally. These thrashers were in serious danger at a critical period. They had much to learn, or else they needed to develop much further in neuromotor control to escape the peril of the cholla.

Two weeks later near Picacho, Pinal County, my field companion, Mr. William L. Engels, brought in a mummified juvenal Cactus Wren (*Heleodytes brunneicapillus*) that he found impaled on thorns at the entrance of a nest. The bird was entire, not partly eaten, and it was of just the age at which young wrens first venture out of the nest. Apparently it had failed to solve the cholla problem. E. C. Jaeger in his "Denizens of the Desert" (p. 73) mentions one similar accident.

In the vicinity of Picacho were many round-tailed ground squirrels (*Citellus tereticaudus*) that frequently foraged among cholla burrs on the ground. Near camp one morning I saw, at a distance of fifty feet, a tumbling mass of cactus burrs and animal. I approached quickly and found one of these small squirrels attempting to run with three large cholla joints stuck to its body. The burrs repeatedly upset the squirrel, painfully rolling it over and setting the spines deeper. Finally it reached its burrow, ten feet away, but the burrs stuck in the entrance and the animal lay there squeaking. After I pried at the burrs with a stick, the squirrel made another effort and pulled all the cactus joints down a couple of feet to a turn in the hole. There it lay helpless. It is unlikely that it could

have extricated itself from such an entanglement.—ALDEN H. MILLER, *Museum of Vertebrate Zoology, Berkeley, California, July 7, 1936.*

Notes on Some Nests Found in Eastern Riverside County, California.—In company with Mr. W. J. Sheffler and Mr. Robert Hannum of Los Angeles, California, a trip was made to the vicinity of Blythe, Riverside County, California, in the spring of 1936. The object of the trip was the collecting of eggs of the Harris Hawk (*Parabuteo unicinctus harrisi*) and Treganza Blue Heron (*Ardea herodias treganzai*).

On April 21, 1935, a similar trip had been made and, after much difficult "slushing" through tule thickets and flooded mesquites, a nesting colony of Treganza Blue Herons was located, but all nests on that date contained young birds. A set of two hawk eggs, incubation advanced, was taken on this date, but it was not certain in our minds that the eggs were those of a Harris Hawk.

On March 21 and 22, 1936, we returned to the vicinity and found that the dead cottonwoods in which the herons had nested in 1935 were blown down. However, after a further search, a colony of about twenty-five pairs of breeding birds was found. In the short time at our disposal, we investigated about half of the occupied nests and found two nests with five well-incubated eggs, four nests with four eggs each (two sets fresh and the other two sets half incubated), and several nests containing three eggs each. The sets of three eggs taken were well incubated, proving that they were full complements. The nests were all placed in dead flooded mesquites, about ten to fifteen feet above the surface of the water, which in many places was well over our heads in depth.

While we were approaching the heron rookery, a hawk was seen to leave a nest placed in the same sort of situation as the heron nests in the dead mesquites. Upon investigating the nest, a set of seven eggs, ready to hatch, was found. We were able to observe the hawk closely and positively identify it as a Harris Hawk. This set of seven eggs appears to represent the laying of two females, for three eggs are easily picked out from the remaining four in size and shape, although all seven eggs were equally well incubated. This set of eggs is now in the collection of Mr. Sheffler. On the same day, March 22, another nest of Harris Hawk was found, containing two eggs slightly incubated, which eggs are now in my collection. These two sets and the set of two taken last year which now may be positively identified establish the Harris Hawk as a regular breeding bird in California.

Regarding the nesting of the Treganza Blue Heron in California, Mr. Sidney Peyton informs me that some years ago he found three nests placed in the tules of Salton Sea, Imperial County, all containing young birds. He attributed these nests to this race, but no specimens were taken for positive identification. A nesting female taken by Mr. Hannum at the colony which we visited has proved to be *Ardea herodias treganzai*. There is some difference in size of the heron eggs, the smallest egg measuring 62×46 mm., and the largest measuring 66×52 mm. The Harris Hawk eggs are indistinguishable in size from those which I have taken in Lower California, Mexico.

An unusual nest of a Plumbeous Gnatcatcher (*Poliophtila melanura melanura*) was found on March 21 in a mesquite near Coachella, Riverside County. The bird had used the base, feather lining and outer thorny twigs of a Verdin's nest; she had shaped it a bit to suit her fancy, but had failed miserably to uphold the standard of construction of gnatcatcher nests in general. There apparently had been no attempt made by the gnatcatcher to build her own nest, as the eggs were laid in a lining of Gambel Quail feathers, typically a Verdin trait.—J. STUART ROWLEY, *Alhambra, California, July 11, 1936.*

A Pacific Golden Plover Reaches California.—Whenever Allan Brooks visits the California Museum of Vertebrate Zoology, as he last did early this year, he never fails to find something in our collection that has escaped the notice of bird students resident here. This time it was a previously misidentified skin of Pacific Golden Plover (*Pluvialis dominica fulva*)—California-taken at that! And when once pointed out, there is no doubt about the identification.

The bird had, of course, been concealed in a series of Americans. It is no. 43999, Mus. Vert. Zool.; collected by Donald D. McLean on Bay Farm Island, Alameda County, California, January 15, 1922. It is naturally in winter plumage, and it is a close match for a specimen of *fulva* (no. 12519) taken by Miss A. M. Alexander on Molokai, Hawaiian Islands, February 12, 1910. These two *fulva* contrast with California-taken *Pluvialis dominica dominica* most conspicuously, as pointed out to me by Major Brooks, by the coloration of the lower surface; in *fulva* there is a well defined dull brownish chest area set off rather sharply against the extensively clear white abdominal area, whereas in *dominica* the lower surface is mottled grayish brown from the lower throat clear back to the lower tail coverts. In *fulva*, too, there is more extensive pervasion of clear apricot yellow throughout the dorsal surface; also this color extends dilutely over the sides of the head, and even tinges the pectoral area. There are dimensional differences, also. In *fulva* the wing is shorter, the bill longer, than in *dominica*. No. 43999, the California-taken male, gives the following measurements: Wing 166 millimeters, tail 65, culmen 24.4, tarsus 45.0, middle toe without claw 22.9. These measurements have

meaning when compared with the tables for *dominica* and *fulva*, respectively, in Ridgway (Birds N. and Mid. Amer., vol. 8, 1919, pp. 84, 89).—J. GRINNELL, *Museum of Vertebrate Zoology, Berkeley, California, May 28, 1936.*

California Thrasher Nesting on the Mohave Desert.—A nest of the California Thrasher (*Toxostoma redivivum redivivum*) was found May 3, 1936, on the Mohave Desert about half way between Summit and Hesperia in San Bernardino County, California. The nest, containing three almost fresh eggs, was placed two feet above the ground in *Artemisia tridentata* and was of normal construction. In other years I had seen both California and Leconte thrashers in this vicinity and had seen nests of the latter about two miles farther out on the desert, but this was my first breeding record for the California Thrasher on the desert side of the San Bernardino Mountains. The brooding bird was observed at close range, both while on the nest and while making a fuss. The eggs were normal for shape, color, and markings, but the weights in grams were only 5.63, 5.27, and 5.11. For a close neighbor the thrasher had a Scott Oriole with a nest in a Joshua tree a few feet distant.

The average weight of 103 eggs of this thrasher from nests on the Pacific side of the mountains, mostly in the San Bernardino Valley, is 6.58 grams; maximum, 8.06 grams, and minimum, 4.90 grams. Fifty-nine nests with complete sets of eggs observed in the San Bernardino Valley contained from two to four eggs each. The average number of eggs per set was found to be 3.07, and 83.1 per cent of the nests had three eggs.—WILSON C. HANNA, *Colton, California, June 16, 1936.*

The Present Status of the Great Salt Lake Bird Colonies.—A changing environment continues to affect the birds nesting on the islands of Great Salt Lake. This is shown by recent data gathered by Mr. Milton T. Rees, of Salt Lake City, and members of the Utah State Fish and Game Department. The information presented here applies to the 1935 and 1936 nesting seasons, thus bringing our meager knowledge of the fluctuations of the local populations down to date. As compared with his counts of 57 occupied cormorant nests and 11 heron nests on Egg Island, April 10, 1935, Mr. Rees found but 39 cormorant nests and 7 heron nests occupied at the same island on April 18, 1936. On this date there were eggs only, in the cormorants' nests. Six of the heron nests contained eggs; the seventh had three young. However, on May 9, 1936, when the island was next visited, the number of occupied cormorant nests had increased to 59. Many had large young, while others had eggs. The herons also had increased on the island since his earlier visit, for 15 occupied nests were counted. Certain herons that had been disturbed at Hat Island earlier in the season may have come over to Egg Island for a late nesting. At the nearby White Rock colony in the spring of 1935 Mr. Rees found one heron nest amid all the gulls. This was abandoned in 1936. The gulls had not yet commenced to lay on either Egg Island or White Rock by April 18, 1936, but there were hundreds of eggs on May 9, at Egg Island. Many adult cormorants were noted with nuptial plumes on April 18, 1936, all of which were coal black. These plumes were all gone by May 9, 1936.

The situation on Hat Island is somewhat discouraging. When Mr. Rees visited this island on June 1, 1935, he saw about 400 pelicans loafing on a sand bar, but not a pelican nest was to be found. Many herons were nesting, but the exact number was not determined. However, the observation was made on this date that about half of the heron nests contained eggs, the other half young. As usual, thousands of gulls were present and it was estimated that about a third of their eggs had hatched. This island also was visited in 1935 on June 4 by members of the Fish and Game Department, who also found the island deserted as a nesting site by the pelicans. Members of this last party counted 17 nests of the Treganza Blue Heron. This year, on May 3, 1936, Mr. Rees again visited Hat Island. For a second year no pelicans were found nesting there. Not a heron was seen, nor were there any eggs in the heron nests. However, in one nest were some broken shells, undoubtedly remnants of eggs laid earlier in the season. Gulls were as numerous as ever. A few gull eggs were seen but most of them were broken. A crow or raven was seen to leave the island as the boat approached. More significant was the finding of coyote tracks on the island; also automobile tracks approaching from the southwest, thus indicating that man had disturbed the colony some time earlier in the season.

In this connection it should be recalled that the level of the lake, although fluctuating a little each year, has nevertheless been dropping steadily for several years and reached a new low last year. As early as the summer of 1933 one could have walked to Hat Island on sand bars by way of Carrington and Stansbury islands. Since then there has been dry lake bed between all these "islands" and the mainland. Even this year, with a 26-inch rise in the lake level, the island is still connected with the land. The lowering of the lake waters has removed the isolation and protection from the Hat Island colony by allowing easy access to predators, both man and beast. Thus is nature adding to man's toll on the herons and pelicans.

No one knows as yet what has become of the thousands of pelicans that once nested on Hat Island. They might still be present in the region but not as nesting birds. The Gunnison Island colony did not seem to have been augmented in 1935, for A. M. Bailey (Bird-Lore, vol. 37, 1935, p. 331)

after a visit there June 19, 1935, found that the breeding birds were not as numerous as they were when I visited the island on June 29, 1932. Gunnison Island is extremely remote and has not to my knowledge been visited this year. Certainly the numbers of pelicans must be decreasing in the region, if for two or three years now no young have been reared on Hat Island where once one of the largest colonies of breeding pelicans was located. It is in critical times such as now exist that the White Pelican population throughout the country is most likely to be permanently reduced. Now, if ever, the White Pelican in other places as well as in the Great Salt Lake region needs all the protection that can be given.—WILLIAM H. BEHLE, *Museum of Vertebrate Zoology, Berkeley, California, May 20, 1936.*

An Albinistic Arizona Hooded Oriole.—Among the two or three broods of Arizona Hooded Orioles (*Icterus cucullatus nelsoni*) which left their nests near my home in Azusa during June, 1936, was one individual which was decidedly lighter in color than normal. Its body and tail were uniform pale yellow, much lighter and clearer than in other members of the brood, while its wings were silvery white and unmarked. The bill was flesh colored and the eyes dark. Far from appearing freakish, like many partly albino birds, this one was more attractive than its ordinary companions, especially in



Fig. 40. Albinistic immature Arizona Hooded Oriole; body and tail pale yellow, wings silvery white. Azusa, California, June 27, 1936.

flight, when its silvery wings flashed conspicuously. It was normal in its actions, and possibly a little more aggressive than most of the others.

The photograph (fig. 40) shows this bird drinking at a bottle of sugar syrup which it visited many times a day until the brood dispersed. It is to be hoped that it will survive and return in succeeding years, in order that the nature of its adult plumage may be learned.—ROBERT S. WOODS, *Azusa, California, July 9, 1936.*

NOTES AND NEWS

Frank Hands, member of the Cooper Club since 1920, passed away June 19, 1936, at the age of 74. Most of his life was spent in the Chiricahua Mountain district of southeastern Arizona where he was a pioneer in the frontier

days of that country. He was a naturalist at heart and an accurate observer of nature during his constant travels in the mountains and desert. Early interest in animals was fostered by experience as a game keeper in England. The

Hands ranch in Pinery Canyon was a regular stopping place for naturalists who came to learn of the fauna of the interesting Chiricahua range. Many of the records for the region center about his place and many of those not actually reported by Hands came to light through his own endeavors. It was here the Thick-billed Parrots spent part of a winter, often feeding in the snow of his door yard. Hands was well read and kept in touch with ornithology outside his own world. He was a charming gentleman, and the generous hospitality which he and Mrs. Hands extended their visitors will never be forgotten.—A. H. M.



Fig. 41. W. Lee Chambers: Member of the Cooper Ornithological Club since 1897; for 28 years Business Manager of the Club and thus probably known to more western bird students than is any other one person. His reminiscences appear in this issue (p. 199).

A worthy suggestion in the interests of preservation of primeval conditions in our national parks has been put forward by the National Parks Association (Nat. Parks News Service, Number 41, June 8, 1936). This is embodied in the following resolution of the Board of Trustees of the Association:

"Resolved, that the National Parks Association

in its own usage, and for the benefit and understanding of the people of the country, shall segregate from all other national parks, and designate by the title of National Primeval Parks System, those national parks which, by reason of possessing primeval wilderness of conspicuous importance and supreme scenic beauty, conform to the standards originally recognized under the title of National Parks; and that it shall persistently urge this segregation and this title upon the people of the country, citizen organizations, Congress and the Government, in confident expectation that, in good time, it will receive official and universal recognition."

Persons concerned with preservation and administration of primitive areas can make good use of this much-needed classification in emphasizing the distinctness of policy and procedure suited to maintaining Primeval Parks in contrast to Historical Parks, Military Parks or other such enterprises now under the wing of the National Park Service.—A. H. M.

Steller Jay, Steller Eider, Steller Sea Lion and Steller Sea Cow are animal names which commemorate perhaps the earliest real naturalist to visit any part of western America. Dr. T. S. Palmer gave us a brief account of this man in volume 30 of *The Condor* (1928, p. 297). Now we have before us an entire octavo volume devoted to "Georg Wilhelm Steller, The Pioneer of Alaskan Natural History" (Harvard University Press, 1936, pp. xxiv + 623, 30 pls.). The scholarly treatment of this subject, documented as to every fact, is the result of years of painstaking labor by the author of this book, who is Dr. Leonhard Stejneger of the staff of the United States National Museum. Dr. Stejneger himself, in 1882 and 1883, traversed much of the territory Steller did over 140 years previously, and with a copy of the latter's account of Bering Island in hand. Stejneger's own classic report on the ornithology of the Commander Islands and Kamtschatka (Bulletin 29, U. S. Nat. Mus., 1885) resulted. The present biography of Steller owes its appearance, we have reason to believe, to the active interest in the project, of Dr. Thomas Barbour, Director of the Museum of Comparative Zoology, Cambridge. Steller, it is now clear, was the first white man to set foot on Alaska soil, which he did on Kayak Island, within sight of Mount Saint Elias, on July 20, 1741. On that day was obtained the first known specimen of the bird many years afterward named *Corvus stelleri* by J. F. Gmelin. As Dr. Stejneger happily declares (p. 271): "If Alaska is in need of a 'state bird,' it can find none more appropriate than the one which immortalizes the name of its first ornithologist."—J. G.

MINUTES OF COOPER CLUB MEETINGS

SOUTHERN DIVISION

MAY.—The regular monthly meeting of the Southern Division of the Cooper Ornithological Club was held at the Los Angeles Museum, Exposition Park, Los Angeles, on Tuesday, May 26, at 8 p.m., with President Little in the Chair and twenty-seven members and guests present.

Minutes of the Southern Division for April were read and approved. Minutes of the Northern Division for April were read. A letter from the secretary of the Pacific Division, American Association for the Advancement of Science, was read, calling attention to the meetings to be held in Seattle, June 16 and 20, and asking for the appointment of two Cooper Club members to serve on the Affiliation Committee. It was moved, seconded and passed that the members who attend from the Northern Division be asked to represent the Southern Division also. The following applications for membership were presented: R. B. Trouslot, Walnut Creek, California, and Libero Seghetti, Eatonville, Washington, by W. Lee Chambers; and Floyd A. McDonald, P. O. Box 283, Vista, California, by John McB. Robertson.

George Willett called attention to the recent paper on the California Quail by E. Lowell Sumner, Jr., which appeared as a publication of the California Fish and Game Commission. Dr. Bishop commented on the usefulness of this paper in giving him ideas on how to keep quail out of certain plant beds in his garden. Members reporting on recent trips and observations were: Loye H. Miller, Dr. Bishop, Raymond B. Cowles, Kenneth Stager, Sidney B. Peyton, and Mrs. Laura B. Law. Mrs. Law told of some friends witnessing a battle between a pair of California Thrashers and a California Jay; the latter evidently had been killing the thrashers' young. The thrashers were the victors and retired leaving the jay dead on the field.

The evening's program, Birds of Laysan Island, was presented by George Willett, who had made a three months' trip to that island in 1912, while in the employ of the U. S. Biological Survey. The stay on the island was primarily to take a census of the breeding pairs of albatross which nested there, and to kill off the rabbits which were becoming so numerous as to threaten the existence of all vegetation on the island. In the census taken of the nesting albatrosses, it was found that there were about twenty thousand pairs, made up of about twelve thousand pairs of Laysan Albatross and eight thousand pairs of Black-footed Albatross. The Laysan Albatross nested in the interior of the island around the lagoon which covered over half the

island, while the Black-footed nested mostly along the beach. Due to heavy rains soon after the party landed, over three thousand Albatross nests were destroyed by the rising waters of the lagoon. Over five thousand rabbits were killed during the three months' stay on the island. Mr. Willett told of many interesting incidents that happened, and described the different species of birds that were nesting there. He had a tray of eggs of the different birds found nesting, and two trays of bird skins that were taken on the trip. These were examined with much interest by all present.

Adjourned.—SIDNEY B. PEYTON, *Secretary*.

JUNE.—The regular monthly meeting of the Southern Division of the Cooper Ornithological Club was held on Tuesday, June 30, 1936, at 8 p.m., at the Los Angeles Museum, Exposition Park, Los Angeles, with President Little in the Chair and thirty-one members and guests present. Minutes of the Southern Division for May were read and approved. Minutes of the Northern Division for May were read.

Applications for membership in the club were: Herbert Pierre DeTracey, Bradley, California, and Richard Codman, Jr., Fair Oaks, California, by John McB. Robertson; Paul Beaubien, Flagstaff, Arizona, by Lyndon L. Hargrave; and Josh Harlan Carey, 1315 Fourth St., Coeur d'Alene, Idaho, by Henry J. Rust.

Dr. Loye Miller reported on the recent publication, "Oceanic Birds of South America," by Robert Cushman Murphy, commenting on the excellency of this work. There was no program to be given, so that the remainder of the evening was spent by members telling about trips they had taken, or of interesting incidents that they had noted in the field of ornithology. W. Lee Chambers reported on the capture of a California Condor on the Tejon Ranch. The bird was placed in a chicken coop for safe keeping, from which it finally escaped. C. O. Reis reported on his recent trip to the Mono Basin. Dr. Miller reported that he had undertaken a study of the songs of the mockingbirds that occur in his back yard. Mrs. Law reported that she had recently heard a male Black-headed Grosbeak singing like a roller canary. Dr. Alfred Lewy, a visitor from Chicago, told of some of his experiences meeting new birds in southern California. A motion was passed that the Southern Division hold regular meetings during July and August.

Adjourned.—SIDNEY B. PEYTON, *Secretary*.

NORTHERN DIVISION

MAY.—The regular monthly meeting of the Northern Division of the Cooper Ornithological

Club was held on Thursday, May 28, 1936, at 8 p.m., in Room 2503, Life Sciences Building, Berkeley, with Vice-president McLean in the Chair and about forty members and guests present. Minutes of the Northern Division for April were read and approved. Minutes of the Southern Division for April were read.

Applications for membership were: Mrs. Horatio Bonestell, 2610 Mountain Blvd., Oakland, Calif., proposed by Eric C. Kinsey, and Charles R. Sprinkle, Box 849, Havre, Montana, proposed by Jean M. Linsdale. Miss Selma Werner reported briefly upon a recent visit to the State Game Refuge near Los Baños, where ninety species of birds were seen. Her query as to how the non-native Pekin Ducks and Black Ducks have become established at the refuge was answered by the Chairman who explained that the former species sometimes escapes from farmyards and joins flocks of wild birds, while the latter species was released on the refuge by the State Division of Fish and Game. An inquiry by Mr. Dyer regarding the disastrous leasing last year of the grazing rights on the refuge during the nesting season of the ducks, was met with an assurance that the mistake would not be repeated.

Mr. Cain reported that on May 15 he had noted a flock of Crossbills in flight over the Oakland scout camp; also that the Red-breasted Nuthatches have again nested at the camp. This year the latter raised their five young, now banded, in a nest box placed for their use. Mr. Dyer's account of the behavior of a young Road-runner observed by him on the Lake Chabot road eleven miles from his home, inclined his hearers to think, with him, that the bird might have been one of the two yearling birds which he recently released on his own hillside.

Mr. Grinnell exhibited a Pacific Golden Plover secured by Donald McLean on Bay Farm Island, January 15, 1922, the specimen having been referred to this race by Major Brooks during his recent stay in Berkeley. He suggested that observers of shore-birds be on the alert for individuals of this race during the winter season.

Mr. Eric C. Kinsey of Manor, Marin County, was the evening's speaker, and his topic "Ornithological Research through Aviculture, Chapter II." The first "chapter" was given to the Division on September 27, 1934. The new "chapter" revealed further advances in the experiments of Mr. and Mrs. Kinsey in keeping native birds healthy and well-plumaged in captivity. There are now 150 individuals, representing 57 species, in their larger aviary, kept fit by almost as many different kinds of food.

Adjourned.—HILDA W. GRINNELL, *Secretary*.

JUNE.—The regular monthly meeting of the Northern Division of the Cooper Ornithological Club was held on Thursday, June 25, 1936, at 8 p.m., in Room 2503, Life Sciences Building, Berkeley, with President Miller in the Chair and about fifty-five members and guests present. Minutes of the Northern Division for May were read and approved. Minutes of the Southern Division were read. Applications for membership were: Orlando F. Weber, Jr., Mt. Kisco, New York, proposed by Hilda W. Grinnell; Joseph Kittredge, Jr., 231 Giannini Hall, University of California, Berkeley, proposed by J. Grinnell; and Milton Charles Albrecht, 2234 Haste Street, Berkeley, proposed by Margaret W. Wythe.

When field notes were called for, Mr. Dyer described meeting with a Road-runner four miles south of his home, which he recognized as one that had been raised on his place in Piedmont. Despite the fact that this bird had not been seen by Mr. Dyer for over two months, it apparently recognized him; for upon being coaxed it flew up to his knee and fed from his hand. Alden Miller then described the reactions of Road-runners around his recent camp in Arizona. Several members participated in a discussion of quail and their enemies. Mr. Dyer mentioned the hazard of gratings over sewers. In his neighborhood, bird-lovers have placed wire mesh over such gratings to prevent the heavy mortality observed in the past, from the young quail falling through and drowning. The discussion then turned to the "broken-wing" behavior of many kinds of birds, and the adequacy of a recently suggested explanation of fright paralysis. Alden Miller reviewed briefly the recent monograph by Dayton Stoner on Bank Swallows, which appeared in the *Roosevelt Wild Life Annals*.

The speaker of the evening was Dr. Seth B. Benson, who had just returned from a three months' collecting trip in Mexico. Many of the birds that he collected were shown and commented upon. The speaker was impressed by the seemingly greater abundance of birds in northwestern Mexico where his observations were made than in this country. Particularly common were vultures, doves and parrots. On Tiburon Island few birds were seen, but several of these constituted new records for that locality. Of more than usual interest was an account of a hunt for a wild turkey. Also of special interest were his observations on Barn Swallows nesting in the best room of a Mexican dwelling where he stayed. After the talk, the specimens proved a center of attraction for members and guests alike.

Adjourned.—WILLIAM H. BEHLE, *Acting Secretary*.

